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COMPUTERWORLD

Informix plots parallel DBMS, monitoring tools

Major architecture overhaul aims to improve query time

By Kim S. Nash

Following rivals Sybase, Inc. and Oracle Corp., Informix Software, Inc. plans to disclose later this month a major revamp of its database architecture that supports parallel processing, sources close to the company said last week.

The firm is also expected to outline plans for management tools for monitoring client/server systems at its announcement, which is scheduled for Nov. 29.

Due to ship in the first quarter of 1994, On-Line 6.0 will inaugurate Informix's Dynamic Scalable Architecture, which will lay the groundwork for growing the database from a single-processor product to one that supports loosely and tightly coupled machines.

The goal is to improve query processing time as least tenfold, said a source close to Informix.

Sequent Computer Systems, Inc. is building the product with Informix.

Relational databases on purullel hardware are attractive to users looking to move big, company wide applications off main frames and other monolithic systems to client/server setups, users and analysts said. "Parallelism is going to be key for us," said Stephen Skinner, senior

Informix, *page 15*

Noorda sets exit date

By Elisabeth Horwitt



Ray Noorda

After many false alarms, Raymond J. Noorda late last week said he will step down as chief executive officer of Novell, Inc. — by next June, his 70th birthday.

The announcement, which comes as Novell's revenue growth is beginning to slow, is Noorda's response to pressure from the board of directors to bring someone in who can move the company to "the

Noorda, *page 8*

IBM humanizes PCs

Future PowerPCs to accept commands via voice, touch, pen and gestures

By Michael Fitzgerald and Ed Scannell

IBM's Power Personal Systems division last week unveiled a sweeping PowerPC systems road map for 1994 replete with ground-breaking technology that promises to change the way people work.

The RISC-based PowerPC system will accept commands via voice, touch, pen or gestures, as well as through a keyboard, IBM said.

One intriguing piece of the interface is a so-called "conversational surrogate," a Max Headroom-like virtual person who will pop up on the screen and respond to commands from the user. It will have facial expressions and human features to make it more user-friendly.

"[IBM wants] to be the Mac of the '90s," said Jeffrey Henning, an analyst at BIS Strategic Decisions in Norwell, Muss.

Other observers pointed to the new systems' potential market impact.

"This is the first thing that's come along that has any chance at all of creating a serious challenge to Intel as a standard," said Joseph Schoendorf, a partner at the San Francisco venture capital firm Accel Partners, Inc. "But keep in mind that a new platform is hard to do and will take some time. The industry should welcome it because it levels the playing field [against Microsoft and Intel]."



IBM will display the interface running on PowerPC prototypes, including two desktop offerings and a notebook, at Comdex/Fall '93 in Las Vegas this week. Officials said the company will begin shipping developmental systems to software vendors in early 1994 and make the products generally available in the second half of the year. Prices will fall into the middle to high end of the PC market and are projected to range from $3,000 to $5,000.

IBM officials cautioned that the initial implementations of PowerPC will feature only some elements of the human factors research. Included will be IBM's Continuous Speech Series,

IBM, *page 25*

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NT starts slow as users seek more meat

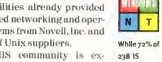
By Ed Scannell

As Microsoft Corp. enters the business of industrial-strength operating systems with Windows NT, it is likely to discover that its relentless marketing machine can take it only so far.

In the first 100 days of the product's availability, Microsoft has persuaded some key large accounts to center the development of mission-critical applications around NT. But most users are proceeding cautiously and asking tough questions about what it is that NT offers above and beyond the capabilities already provided by advanced networking and operating systems from Novell, Inc. and a variety of Unix suppliers.

"The MIS community is extremely driven by business pressures and trends and can't afford to wait for technology," said John Donovan, an analyst at Work-Group Technologies, Inc. in Hampton, N.H. "While NT matures in public, we are finding a lot of people focused on Unix server-based applications in client/server environments. While NT gets ready, Hewlett-Packard, Sun Microsys-

NT, *page 16*



While 72% of 238 IS managers said they plan to move to 32-bit operating systems, only 15% said they would do so next year.

High-speed networking

Utility powers up ATM to cut costs, increase capacity in deregulated era

By Joanie M. Wexler

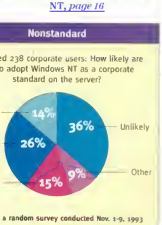
Amid a business climate of relaxing regulatory shackles, Northeast Utilities is making an industry-pioneering commitment to Asynchronous Transfer Mode networking to ensure success in a newly competitive arena.

The utility is turning first to the emerging high-speed network for its sheer capacity and bandwidth-management capabilities, said Tod Dixon, vice president of information resources. The move represents a bottom-line effort to pare costs in an era when utilities for the first time are facing competition, he said.

Because it owns its transmission facilities and rights-of-way, the three-state power company, based in Berlin, Conn., is building a mainly private ATM network. The project is being launched at a time when ATM activity has barely gotten off the ground and most companies are tending to turn to public services in lieu of private networks.

Utilities are on a general kick to save money with technol-

ATM, *page 10*



Newspaper

You Can Play Around With Windows NT On Another Microprocessor.



Inverted Back

Back

1. Follow instructions on the other side

1. Follow instructions on the other side

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2. Insert this sheet with
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    2. Arrow pointing to the fold
3. Slice the folded edge
4. Close the page and slip-sheet

Foldout slip-sheet

Folded edge of the page

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Putting Imagination To

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You Can Play Around With Windows NT On Another Microprocessor.



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Computerworld's Guide to Next-Generation PCs

■In the approaching **slugfest between Pentium and the PowerPC**, Intel will have an edge in software transportability, while IBM, Apple and Motorola can stress performance advantages. Right now, IS managers say they are interested but not anxious to buy. Right now, says Derek Slater, smart shoppers are browsing the 486 aisle. *Pages 148* **Dell's OptiPlex** delivers great value for the dollar, according to users, who gave it the highest satisfaction rating in the **Buyers' Satisfaction Scorecard** on **486 PCs.** *Page 174* **The first users of NCR's new dual-Pentium system** say it's a top performer. *Page 177*

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Executive Briefing

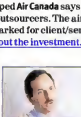
Anyone who doubts how important **speed to market** really is need only look at what's happening to OSF with its **Distributed Management Environment.** The market isn't waiting for the organization to get all the pieces in place and DME may wind up out of the running. *Page 4*

Interface convergence. In her column this week, **Esther Dyson** points out that all the hoopla about handwriting recognition is misleading, because no **single interface method** is really sufficient. *Page 37* **IBM** seems to agree, given its announcement last week of plans for a RISC-based PowerPC system that will accept commands delivered in a multitude of ways, including gestures. *Page 1*

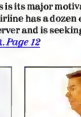
The inevitability of client/server: Marc Dodge, columnist and corporate communications executive, contends that, although client/server still has lots of rough spots, it is really the **only game in town** and IS execs had better get used to the idea. *Page 37* And Bill Laberis suggests that CIO **avoidance of PC-based technologies** has become darned near suicidal. If you aren't reading this at Comdex, he says, your successor may be. *Page 36*

What do outsourcing customers want? Not necessarily business process re-engineering expertise, judgingby one recent contract. When **Southern Pacific Railroad** decided to entertain bids from outsourcers, it listened to pitches from **Perot, EDS and ISSC.** The first two stressed re-engineering; ISSC stuck to processing and walked away with the 10-year $415 million contract. *Page 12* For lots of other customers, **the motivation is financial assistance** with the up-front costs of moves to new environments. That's what cash-strapped **Air Canada** says is its major motivation in requesting bids from outsourcers. The airline has a dozen or more applications earmarked for client/server and is seeking assistance in spreading out the investment. *Page 12*

SOUNDOFF!



► *Papows*



► *King*

Can end-user developers help beat the backlog?

Yes, says Lotus' Jeff Papows, because they build systems they need. But developer Jon King says no way: Users create a mess IS has to clean up.

For more on the debate, see In Depth on page 180

How to contact Computerworld editorial:

	Phone:	Fax:
Main office, Framingham, Mass. 24-hour tip line	(508) 879-0700 (508) 820-8555	(508) 875-8931
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Host connectivity

SNA Server ships

By Elisabeth Horwitt

The good news is that Windows NT picked up IBM host connectivity last week as Microsoft Corp. shipped its SNA Server. But the bad news is that it appears Microsoft has reneged on its attention-grabbing promise to price the product at about 20% below a competitive offering from Novell, Inc.

Microsoft's SNA Server pricing

Number of users	Promised price	Current price
UP TO 20	$1,495	$995 (up to 10 users)
UP TO 64	NOT APPLICABLE	$5,995
UP TO 250	$5,995	$14,995

Specifically, SNA Server costs more than twice what Microsoft originally said it would cost for the high-end, 250-user, 500-session version. The company upped the price in response to "feedback from our [reseller] channel that they needed more margin," a spokesman said. In addition, Microsoft reworked the pricing structure to better align it with existing Windows NT applications such as SQL Server's structure, he added.

The pricing of the high-end product is particularly onerous since a given server can support only 250 users, said a beta user at one major energy company, who asked not to be identified.

On the plus side, the product's graphics-based setup and administration procedures do deliver on Microsoft's ease-of-use promises, beta users said.

Windows users have been able to download files from the mainframe to Windows PCs much more quickly via the SNA Server as opposed to directly through Microsoft's Access for Windows, according to Judy Shank, senior technical analyst at King County Medical Blue Shield in Seattle. One main reason is that the server allows users to set bigger block sizes for transfer than Access does, she added.

Several leading PC-to-host connectivity vendors last week announced software to work with SNA Server, including Digital Communications Associates, Inc. in Atlanta, Eicon Technology Corp. in Montreal, Network Software Associates in Laguna Hills, Calif., OpenConnect Systems in Dallas and Attachmate Corp. in Bellevue, Wash.

In addition, Micro Decisionware, Inc. in Boulder, Colo., released its Database Gateway for Windows NT, which is said to support bidirectional data transfer between relational and nonrelational mainframe databases and SQL-based databases running on Windows NT. The product runs over SNA Server. Prices start at $2,000 and are based on the number of user connections.

Windows NT closes in on network independence

By Elisabeth Horwitt

Microsoft Corp. last week said it expects to realize its goal of making Windows NT the first truly network-independent client in the first half of next year. This would allow users and applications on an NT workstation to transparently access resources across the enterprise, independent of what network operating system or transport they happen to reside on, said Microsoft product manager Dwight Krossa.

Microsoft and third parties are coming out with NT redirectors for Banyan Systems, Inc.'s Vines, Novell, Inc.'s NetWare and Sun Microsystems, Inc.'s Network File System in the first half of next year, vendor spokesmen said. Digital Equipment Corp. will provide DECnet client software for NT in Pathworks for NT Version 4.1, due out by year's end, a Digital spokeswoman said. NT support for Digital's Local Area Transport will come later.

Ill will

Competition between Novell DOS 7.0 and Microsoft's Windows family is behind the recent bickering between the two vendors.

Furthermore, NT will have access to the full range of IBM networking environments with the shipment last week of Microsoft's SNA Server (see story at left).

The redirectors will work in combination with Microsoft Dynamic Link Libraries and Network Driver Interface Specification (NDIS) 3.0 to allow NT users and applications to browse seamlessly across various network operating system environments — a capability no other client system offers, said Claude King, senior systems analyst at the University of Florida's College of Journalism and Communications.

Microsoft has also positioned its clients to be network transport-independent through NDIS, which currently supports a range of protocols, including TCP/IP, SPX, NetBEUI, XNS and Open Systems Intereconnect, Krossa said. When an application initiates a request across the network, NT software tries each transport protocol in turn until it finds the right one to access that particular resource, he added.

Furthermore, the next version of Windows, code-named Chicago, will have the same network capabilities as NT, King said. "This is making Novell worried because it makes NT and Windows universal clients," he said.

Novell still refuses to license to Microsoft the code that would allow Windows for Workgroups — a network-ready predecessor to Chicago — to access NetWare services, Krossa said. Novell fears that Windows for Workgroups will heat out Novell's own network-ready client, DOS 7.0, he added.

Novell claimed, however, that Microsoft lost the license because it was unwilling to comply with all the terms. The two vendors are said to be close to agreement.

The license would have allowed Microsoft to bundle NetWare access into Windows for Workgroups; however, users can still download the code from a NetWare server or get it from Novell.

Competition between Novell DOS 7.0 and Microsoft's Windows family is responsible for the recent bickering between the two vendors about Novell's licensing of NetWare redirectors to Microsoft, King and Krossa indicated. Novell has agreed to license to Microsoft the support code to give Windows 3.11 easy access to NetWare services; however, users will still have to get the redirector from Novell.

Another hopeful development is the recent release by Novell of an updated beta version of its redirector for NT, which fills in several key missing features such as support for NDIS; for DOS applications under NT; and for Digital Alpha and Mips Technologies, Inc. versions of NT, Novell product manager Jeff Turner said.

Wireless technology gets Lotus vote

By Lynda Radosevich

■ **An emerging form of wireless computing that can potentially alleviate some of the existing wireless services' speed and coverage gaps will receive a boost at Comdex/Fall '93.**

Lotus Development Corp. and wireless service provider McCaw Cellular Communications, Inc. will reveal today that they are working together to enable Lotus' electronic messaging products to work over Cellular Digital Packet Data (CDPD) technology networks.

CDPD wireless networks will operate over cellular telephone channels and compete with wireless data services such as the RAM Mobile Data network and the Advanced Radio Data Information Services (Ardis), a joint venture of Motorola, Inc. and IBM.

McCaw will launch its first CDPD network in Las Vegas this week and will demonstrate Lotus CC:Mail operating over that network at its Comdex booth. Although Lotus backs CDPD technology, it will not provide any specific plans until 1994, according to a Lotus spokesman.



Top penetrators

One issue with wireless coverage is how well it works indoors. Ardis and cellular services penetrate buildings better than RAM Mobile Data's network, according to analysts.

Lotus currently offers CC:Mail products that work over the RAM Mobile Data network. The McCaw arrangement is not meant to compete with that partnership but to give users more choice in their wireless network services, according to a Lotus product manager.

Lee Noian, a senior telecommunications engineer at The Travelers Corp. in Hartford, Conn., said he is interested in using CDPD technology to provide wireless access to mobile executives who currently use RAM Mobile Data network wireless services.

"CDPD has the potential to solve the coverage problems that RAM [Mobile Data] has, and I'm hoping it will operate faster," Noian said. Other vendors will also demonstrate CDPD technology at Comdex [see roundup page 29].

A McCaw spokesman said the service will operate at 19.2K bit/sec. — a speed that Ardis said will reach initial markets beginning this week. RAM's data network operates at 8K bit/sec., but the difference in operating speeds does not translate to a difference that end users see because of the variety of ways that technologies use channel handwidth, said Eric Zimits, an analyst at Volpe, Welty & Co., a San Francisco consultancy.

Wireless coverage

Cellular Digital Packet Data (CDPD) will potentially offer broader coverage than existing RAM Mobile Data and Ardis wireless data services because of the greater number of cellular base stations. However, cellular vendors must first unite their services.

BASE STATIONS



Source: Dataquest, Inc. San Jose, Calif.

McCaw also said its CDPD network will cover 42% of the U.S. population by the fall of 1994 and that arrangements with other CDPD providers will cover the remaining 58%. That level of coverage is possible because CDPD uses existing cellular telephone networks, according to McCaw.

While the potential exists, there are still outstanding issues surrounding CDPD services. It remains to be seen how long it will take to provide nationwide coverage, Zimits said.

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Overdue DME pieces arrive

IBM, HP are noncommittal; both push their own frameworks

By Jean S. Bozman

The Open Software Foundation (OSF) shipped five distributed components of its long-awaited Distributed Management Environment (DME) last week, but OSF founders Hewlett-Packard Co. and IBM stopped short of committing to incorporating all of the DME services into their systems management frameworks.

DME 1.0's shipment comes as sources close to the OSF contend the group is about to undergo organizational changes (see story at right). It also comes as questions linger over whether a full-bodied version of DME will ever see the light of day.

The OSF's DME 1.0 is a set of five distributed applications for systems management. They handle software distribution, license management, event notification, PC services and subsystem management services, said Lance Travis, DME business area manager at the OSF in Cambridge, Mass. The services will allow users to manage distributed resources as if they were installed on central servers.

Still missing, however, is the DME "framework," which was originally expected this year but is now due by 1995 [CW, Oct. 4]. The framework is being redesigned to comply with the Object Management Group's Common Object Request Broker specification.

In the meantime, HP and IBM are not waiting. They are selling their own Unix network management product suites — HP's OpenView and IBM's NetView/6000 — which would have to be retrofitted to support DME 1.0. HP and IBM will not reinvent their existing products, both companies said. IBM is evaluating DME technology but may not commit to all the DME 1.0 modules. Ron O. Williams, manager of IBM's client/server executive programs at the company's Marketing and Services Division in Raleigh, N.C., said IBM has tried to keep NetView compliant with DME.



Up and running

As DME 1.0 begins to ship to systems vendors, Charles Schwab in San Francisco last week put its first distributed applications into production in Phoenix, allowing users to log on to the corporate network and pick computing services off remote mainframes and Unix servers. Six or seven so-called Distributed Computing Environment cells will be in place nationally by next year's end, according to Jim White, vice president of technical planning.

Work to be done

Even though HP supplied much of the technology used in DME 1.0, it would have to fix some of its OpenView applications to work with the framework, said Larry Robinson, marketing manager for OpenView platform products at HP's Network and System Management Division in Fort Collins, Colo. HP is also concerned about paying what it says is a "relatively expensive" license fee, he added.

IBM and HP "are now far down other roads toward the provision of distributed services," said Paul Mockapetris, a Gartner Group, Inc. analyst in Santa Clara, Calif. "It stretches the imagination that [the two companies, the independent software vendors] and the users are going to throw it all away in favor of DME."

Some users, meanwhile, have forsaken DME and are jury-rigging their own solutions. "We've looked at what DME is, and we've tried to mimic that functionality," said Jim White, vice president of technical planning at Charles Schwab & Co. in San Francisco, which is moving to enterprise open systems. Prices for the DME 1.0 source code range from $25,000 to $250,000.

Cha . . . cha . . . changes

The emergence of the Common Open Software Environment as an open systems developer and X/Open Co. as a Unix standard bearer has made the OSF appear out of sync, observers said.

"OSF has done what it was supposed to do to a very large extent," said Steve Wendler, a Gartner Group open systems analyst. "I think they're going to adopt a different request-for-technology process. The organization will change and the process will change within the next 90 days." Wendler and others said the OSF will coordinate Unix vendors' research and development programs.

The DME delay has had some benefits. It is allowing users to get comfortable with network management frameworks from HP, IBM and Sun Microsystems, Inc. that can be enhanced with systems management services, analysts said.

"These suppliers would be perfectly satisfied to simply continue providing their own solutions based on DME and to let OSF play the role of architect and visionary rather than platform supplier," said Thomas Willmott, a vice president at the Aberdeen Group in Boston.

An OSF spokesman, meanwhile, said the organization's board has proclaimed that the OSF's technology will be preserved by the outfit's founders, no matter what the future brings.

—Jean S. Bozman

Pac Bell begins superhighway trek

By Joanie M. Wexler

Another chunk of the U.S. information superhighway got spoken for last week when Pacific Bell said it will begin work on a $16 billion, seven-year overhaul of its statewide network in California aimed at reaching 5 million businesses and residences by the year 2000.

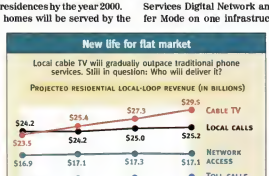
An initial 1.5 million homes will be served by the high-capacity network by the end of 1996 in parts of the San Francisco Bay, Los Angeles, Orange County and San Diego areas.

The goal is to outfit the state with an infrastructure supporting integrated communications, information and entertainment services, said Lee Camp, vice president of consumer broadband services at Pac Bell.

Network construction, which parallels recent moves by phone companies and cable TV companies to team up on broadband service delivery [CW, Oct. 18], "will begin in earnest" early next year in conjunction with equipment partner AT&T, Camp said. AT&T will provide central office switching and media conversion equipment.

The revamped Pac Bell network will look much like a cable TV network, comprising a fiber backbone stretching into neighborhoods. From there, coaxial cable will run to the side of the home and hook into twisted-pair copper wiring inside.

The idea is for Pac Bell to support a mix of high-speed communications services such as Integrated Services Digital Network and Asynchronous Transfer Mode on one infrastructure, while providing a competitive alternative to cable companies by "renting" barring regional Bell telephone companies from delivering such services in their own regions, Pac Bell would have the infrastructure in place to get into the act. Most analysts agreed it is only a matter of time before those regulatory constraints go away.



Meanwhile, "they want to hold on to businesses in the defense, entertainment and high-tech areas," said Robert Rosenberg, president of Insight Research Corp., a consultancy in Livingston, N.J.

According to Rosenberg, these companies have nearly unlimited bandwidth needs.

Network management

Microsoft's Hermes to run on NetView/6000 platform

By Lynda Radosevich

Users considering weaving Microsoft Corp. Windows NT-based nodes into their enterprise networks will receive two good pieces of network management news today.

IBM, Digital Equipment Corp. and Microsoft will announce that Microsoft's as-yet unshipped Hermes management software for NT will run on IBM's NetView/6000 network management platform.

The NetView/6000 software will run on NT-based servers, including Digital's Alpha line, according to analysts briefed on the companies' plans.

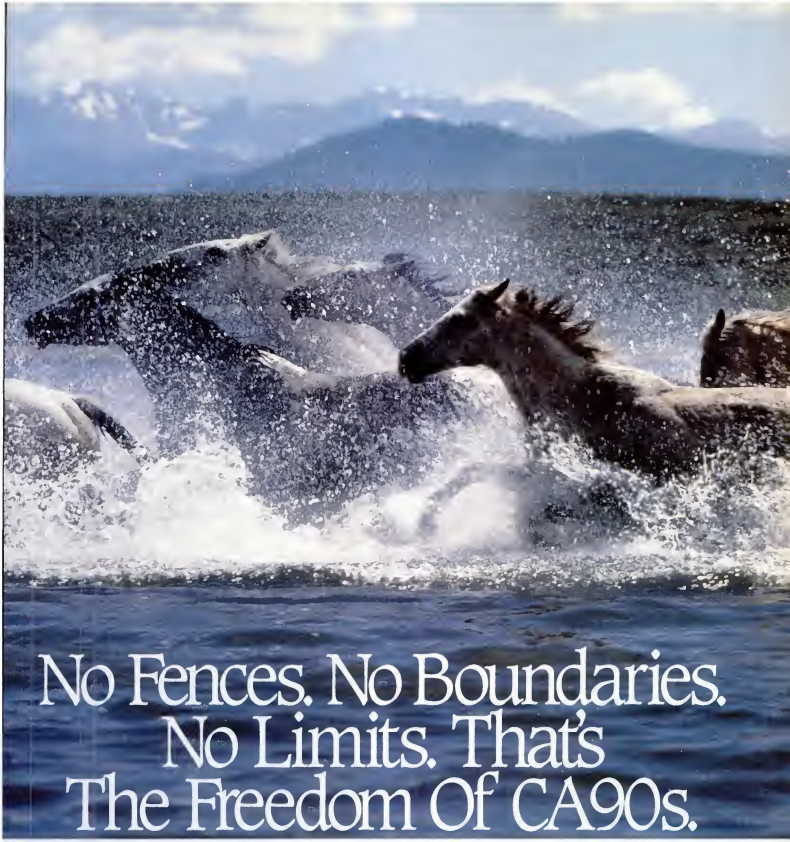
Also, Hewlett-Packard Co. will announce that it is porting its OpenView network management platform to NT and that OpenView will integrate with Hermes, a company spokesman confirmed.

"Although there is not much demand for NT yet, this certainly strengthens NT prospects for an enterprise rollout," said John McConnell, president of McConnell Consulting, Inc. in Boulder, Colo. (see story over 1).

The announcements mean that users will be able to integrate NT management with other management domains such as routers, hubs and Novell, Inc. networks under a centralized monitor, analysts said.

However, it does not necessarily mean that Hermes will be able to exchange information with other management domains that operate on the NetView platform.

"If Hermes finds more client nodes, does that information get shared through NetView/6000 to the routers and reverse? That's a level of integration you may not have," McConnell said.



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More to use, less need to choose

With the advent of Microsoft's Windows NT, it may appear that the choices involved in serving the needs of PC users are becoming increasingly complicated. But, in fact, I would submit that they are getting simpler.

Unix, OS/2 and Windows NT are going to serve as focal points for integrating the desktop at the server level. Three operating systems in this space may be a couple too many for some people, but three is the minimum number of alternatives that competitive areas in any industry tend to spawn.

Look at it this way: The picture is already less complicated than it used to be for those trying to link up end users in proprietary environments. A short while ago, an all-Blue site might have included MVS, VM, OS/400, DOS/VSE and PC DOS.

This growing simplification may not be immediately apparent to those in the trenches coping with the continued onslaught of PCs. But that's the point. PCs are taking over so many end-user desktops that they are screening out proprietary operating systems from Wang, Data General, Digital, Burroughs, etc. End users by the millions are being tied to servers running one of serverdom's Big 3. (Unix, of course, may be counted as many times as one wishes.)

The Meta View



Unix, NT and OS/2 are displacing dozens of older proprietary systems and, in the long run, will simplify the task of connecting end users.

Charles Babcock

Nor should it go unnoticed that these operating systems have become the focal point for third-party development. Firms are offering application development languages and tools that cut across the Macintosh, Windows and Unix, much as experienced database vendors offer tools and gateways that cut across relational databases, regardless of operating system. At some point it should be possible for developers to turn to libraries of objects and configure an application that will run (with proper compiling) under Windows NT, Unix or OS/2.

Competition is a sign of vigorous activity. Such activity attracts resources, some of which are devoted to sorting out the restrictions and barriers to interoperability. Competition is not the same as confusion and may, in the long run, be an antidote to it. In the end, any operating system that survives on the server will have to function as an integrating force, connecting to rival operating systems and legacy systems.

Unix already *is* an integrating force at the server level, particularly in dealing with network protocols. It is a strong candidate to become the application server of choice to large, heterogeneous desktop groups. Software developers coming out of the DOS or Windows environments find dealing with the many variations of Unix an endless irritation. Nevertheless, there is a widely shared body of knowledge on Unix that is transportable across versions.

Windows NT remains a force to be reckoned with, but not necessarily a complication. With its requirement for 16M bytes of memory, NT is a heavy-duty server operating system, not a desktop operating system. As such, it will need a nod from IS managers before it can be widely installed. But NT was designed to work well with IBM environments and will one day sport a full suite of management utilities. It will eventually interface to all the major PC LANs and take on more of Unix's strengths.

Unlike Unix, all of NT's versions will be binary-compatible, so an application will have to be developed only once.

That hings us to OS/2. At the moment, OS/2 is something like kudzu: no one's favorite organism but spreading out anyway. One possible reason is because it can both satisfy a power user and gracefully serve a large group of PCs. The thing to keep in mind here is that IBM is skilled at building a stable operating system and will improve OS/2 until it takes on a universal character.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

Corporate downsizing

IBM mulls sale of federal unit

By Gary H. Anthes and Johanna Ambrosio

IBM said last week that it is considering selling all or part of its federal systems integration division, which though profitable and growing, faces stiff challenges amid severe government spending cuts.

If the unit is sold, it would mark a change of heart for IBM's new chairman, Louis V. Gerstner, who has so far resisted calls to break up the troubled computer giant. Other units may well follow, according to published reports. The storage division and printer company have been named as candidates.

Cash pipeline

IBM's Federal Systems Co. boasts a number of prized contracts, including the following:

Contract	When	Amount
NASA Space Shuttle Orbiter Software Support	July 1993	$359M
Air Force Satellite Control Network	October 1991	$100M
IRS Integrated Collection System	December 1990	$340M
Federal Aviation Administration	July 1988	$3.6B

Source: Federal Sources, Inc., McLean, Va.

In the running

IBM declined to say who might buy its Federal Systems Co. (FSC), but Hughes Aircraft Co. is allegedly in the running, along with others. An IBM spokesman confirmed last week that the se companies "had approached us, and not the other way around." Analysts said FSC might attract a defense contractor that has been hit hy Pentagon downsizing. Such a huyer would he seeking "instant credihility and capahility in the civilian world," said Robert Dornan, senior vice president at Federal Sources, Inc., a marketing services firm in McLean, Va.

But Dornan questioned why the computer maker would sell one of its better-performing units. Last year, the unit earned $71 million on sales of $2.2 billion to the U.S. Air Force, NASA, the Internal Revenue Service, the Federal Aviation Administration and other agencies.

Tarnished jewel

But Jay Stevens, an analyst at Dean Witter Reynolds, Inc. in New York, saw FSC as a tarnished jewel. "Federal Systems is not in the mainstream of what IBM is doing," he said. "Basically, it's not going to grow anymore because of declining federal budgets." He predicted IBM would sell FSC for half the division's annual revenue, or about $1 billion.

Sam Albert, a consultant in Scarsdale, N.Y., said, "It makes good sense to me that IBM is looking for cash, and also is continuing to scrutinize every function to determine what is making the grade and not making the grade."

Restructuring

Big Blue splits network unit into two divisions

By Joanie M. Wexler

Some outstanding pieces of IBM's corporate reshuffling fell into place last week when the company announced that it has divided its Networking Systems group into hardware and software divisions.

The move is indicative of IBM's continued efforts to better compete with smaller, more nimble companies, in part by "divorcing hardware from software so each group has to stand alone to make its revenue," said Frank Dzubeck, an IBM watcher and president of Communications Network Architects, inc., a Washington consultancy. "If your competition is structured that way, why not organize yourself that way, too?"

The Networking Systems fissure follows a restructuring a couple months ago that included the formation of a cross-divisional council as part of Chairman Louis V. Gerstner's efforts to increase cross-boundary decision-making among IBM divisions [CW, Sept. 20].

Three divisions

That move humped up Ellen Hancock from her position as Networking Systems general manager to IBM senior vice president and group executive. With the restructuring, three divisions — Networking Software, Networking Hardware and Software Solutions — report to Hancock.

The idea, analysts said, was to help the company leverage its traditional strength in turnkey solutions rather than hy competing product-hy-product on price or time to market — traditionally not IBM's forte.

"IBM's strength was never in individual products hut in putting together whole scenarios for customers," said Rohin Layland, principal at Layland Consulting in West Hartford, Conn. "They had it fragmented all over the place, and they're trying to put it together more logically now."

Unified force

"We are becoming a unifying force to provide single solutions to customer problems," said Donald A. Haile, new general manager of the Networking Software Divison. Previously he headed up Networking Systems' network access business.

For example, Haile said, he and Steve Mills, who heads the Software Solutions group, "are interacting much more on specific solutions than before Ellen got him."

As an example, Haile pointed to his work with one of his division's products, Communications Manager on OS/2, which implements various network interfaces. He said he and Mills are joining forces to "put together development tools that will use those interfaces."

Haile's new counterpart on the hardware side is William R. Johnson, a former vice president of corporate marketing at Digital Equipment Corp. He will head up activity in network adapter, hub, router and Asynchronous Transfer Mode development as well as in older IBM equipment, such as the 3745 front-end processor and 3174 and 3172 cluster controllers.

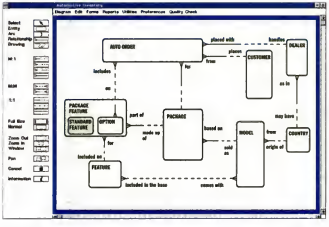
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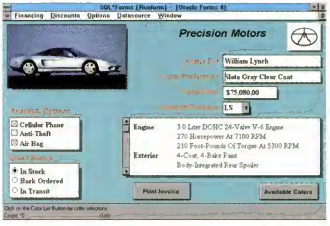
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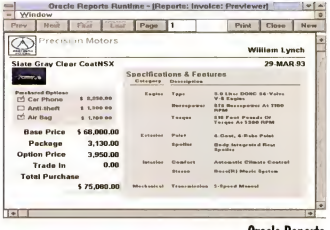
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News Shorts

Novell loses a round in court

A federal judge has denied a motion filed by **Novell, Inc.** to declare invalid a patent infringement charge that an inventor brought against the company. The ruling advances toward trial a 2-year-old, $220 million lawsuit that inventor Roger Billings and the International Academy of Science brought against Novell. The suit alleges that NetWare infringes on Billings' patented Functionally-Structured Distributed Data Processing System, which is said to be a key piece of client/server systems.

Bell Atlantic gets $12.7M DOD contract

The U.S. Department of Defense's **Advanced Research Projects Agency** awarded a four-year, $12.7 million contract to **Bell Atlantic Corp.** to build an experimental high-speed network linking six federal agencies in the Washington area. It will consist of a 2.4G bit/sec. Synchronous Optical Network fiber-optic ring and will connect at 155M bit/sec. to Asynchronous Transfer Mode bub switebes in Bell Atlantic central offices and at government sites.

IBM introduces low-end PC

The **IBM PC Co.** unveiled a low-end PS/2 and made broad price cuts on its PS/2 server Models 85 and 95. The PS/2 Model 53 bas a 25/50-MHz 486SLC2 processor and starts at $2,065. Updates to the PS/2 Models 56, 57, 76 and 77 bave been delayed due to short supplies of IBM's clock-tripling 486SLC3 chips. Price cuts of up to 20% on server models bring the high-end Pentium-based PS/2 Server 95 560 down from $13,385 to $11,335 and the 486-based Model 95s to under $10,000.

SHL to post Q4 loss

Still reeling from the collapse earlier this year of a giant outsourcing deal with **Bell Canada**, Ottawa-based distributed systems outsourcer **SHL Systemhouse, Inc.** late last week said it will report an operating loss for the fourth quarter, ended Aug. 31. The company is also taking a $135 million restructuring charge, including $50 million for "winding down" mainframe contracts. The outsourcer said it is exiting the mainframe husiness — the Bell Canada deal was to have brought it mainframe resources. The write-downs include a devaluation in SHL Systemhouse's ComputerLand Canada trademark.

SHORT TAKES **Hewlett-Packard Co.** said it bas suspended a program that brought 100 programmers from india, China and Russia to the U.S. as temporary workers, citing complaints that the foreign workers were being paid daily living expenses only. Such wages are far less than the U.S. rate of $50,000 to $60,000 annually for similar work. . . . **AT&T** last week became the latest interexchange carrier to introduce Asynchronous Transfer Mode (ATM) services. The company said it would begin controlled introduction of its InterSpan ATM Service during the second quarter of 1994; general availability will follow in the second balf of the year. Initial AT&T ATM services will run at T1 (1.5M bit/sec.) and 45M bit/sec. rates. . . . Hub maker **Cabletron Systems, Inc.** will unveil today an $8,995 module for its Multi Media Access Center smart wiring hub that combines Ethernet switching, bridging and routing. . . . **Polaris Software** in San Diego is offering a free update to fix bugs in PackRat 5.0. . . . **Tektronix, Inc.** has appointed Robert L. Vance to fill the chief information officer slot recently vacated by Alan Jones. . . . **Lexicus Corp.**, a small Palo Alto, Calif., maker of handwriting recognition software, bas been acquired by **Motorola.** The deal is expected to be the final piece in Motorola's wireless handheld strategy. Lexicus will join Motorola's Paging & Wireless Data Group.

Apple finally bolsters support

By James Daly
ORLANDO, FLA.

Apple Computer, Inc. last week moved to repair rough relations with corporate users by rolling out a multitiered support program designed to ease the beadache of maintaining large mixed-platform computing environments.

The introduction of the Support Professional Program at the Mac-IS conference marked a victory in the user group's lengthy battle to have Apple provide an "industrial strength" support package.

"We've been at them for five years to do this, and it looks like they've gotten it right," said Jack Gillenwater, manager of client assistance at Union Carbide Chemicals and Plastics Co. in South Charleston, W. Va.

Additional help

Some users said they would not rely on the Support Professional Program as their sole means of end-user support but would use it to buttress existing programs.

"A lot of our resources are used in just keeping the machines up and running," said Robert Anderson, a senior analyst at A. O. Smith Automotive Products in Milwaukee. "Anything that gives us a hand in that area is welcome."

The Support Professional Program offers four levels of service:

- **The Infrastructure Development program** is designed to get new support staff quickly up to speed. It includes development tools and a self-paced learning system as well as a subscription to



Apple's support journal.

- **Support Briefing** alleviates the need for travel — and its associated costs — while reducing the time spent poring over journals or reading bulletin boards. Subscribers receive a quarterly briefing delivered on CD-ROM. After previewing the information, subscribers can submit questions for follow-up during a toll-free conference call.
- **Support Automation** helps cut troubleshooting time by providing a search capability of Apple's entire technical information library and product manuals. The system then returns with the most relevant articles. Type in "How many Nubus slots are there in a Mac IICX?," for instance, and the system digs up manuals in which that information can be found.
- **Technical Response** is a phone-based assistance package. It includes direct priority access to support engineers, a 60-second response time to all calls and problem resolution through research and development engineers, if necessary.

Introductory prices for these configurations vary from $2,900 to $14,500, said Bret Hydorn, manager of Apple's Enterprise Support Programs.

Earlier this year, Apple unveiled Apple Assurance, much of which is designed for the everyday user [CW, April 12]. The program provides general start-up assistance and troubleshooting as well as toll-free support and a one-year service warranty.

Uniface OS/2 tools debut

By Melinda-Carol Ballou

Uniface Corp. last week brought out a graphical version of its Uniface tool kit for building 32-bit, multitasking OS/2 applications.

The Uniface tools provide developers with an enterprise-level tool set for OS/2 that had been lacking previously, analysts said. "This gives the developer who's looking for a platform something solid to sink his or her teeth into, with its 32-bit support," said Judith Hurwitz, president of Hurwitz Consulting in Watertown, Mass.

With this release, the Alameda, Calif., developer is offering a model-driven development environment that can be used to create applications in the native look and feel of WorkPlace Shell, OS/2's object-oriented user interface. In addition, the tools, also dubbed Uniface, work with OS/2 to act as a gateway to IBM's DB2 and other major commercial relational, flatfile and text-based database management systems, Uniface officials said. Users get full read/write access to IBM's DB/2, DB/22 and DB2/6000 databases, as well as to IBM's Dynamic Data Exchange.

Hurwitz noted that the high cost of Uniface development and runtime licenses is an issue, but she added that the company is aware of this problem.

Uniface for OS/2 Version 2.1 and WorkPlace Shell is available immediately. It is priced at $2,495 for a single-user license.

Noorda

CONTINUED FROM COVER 1

next dollar level," said Frank Dzubeck, president of Communications Network Architects, Inc., a Washington research firm.

Novell's revenue in the first nine months of fiscal 1993 grew 20% to $813.7 million. This compared with 50% sales growth in the like period the previous fiscal year.

Noorda, who owns roughly 10% of Novell, joined the company in 1983 and built the tiny hardware provider into a $1 billion networking giant.

However, "There's a perception right now that Novell has been flopping around for a couple of years and needs someone with real experience at running a billion-dollar company" to help turn it in the right business direction, said David Coursey, editor of "P.C. Letter," a San Mateo, Calif., newsletter.

Noorda will stay on as chairman and will continue to steer Novell's strategic direction, according to a company statement.

Novell's board of directors bas already begun to searcb both inside and outside for a successor, the statement said. The board will be looking less for a technological visionary than for a financially-savvy person — preferably an outsider — who can think in terms of a return on equity, rather than technology, Dzubeck said.

One key area where Novell needs to be more bottom-line-oriented is acquisitions, Dzubeck said. "They invested $500 million in Digital Research and Unix System Laboratories, and they're still not seeing returns."

The strongest internal candidates for the job would be the three members of the office of the president, whicb Noorda formed last August. These include: Mary Burnside, chief operating officer; James Tolonen, chief administrative officer; and Kanwal Rekhi, executive vice president of corporate technology.

Gentlemen, start your snails.

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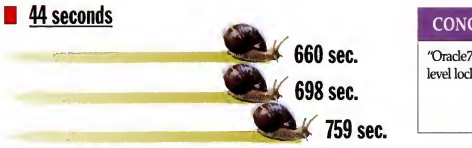
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Just to be fair, here's what PC Magazine had to say about the other guys:

Informix OnLine *"Only after days and days of repeated crashes were we able to obtain a full set of results."*

Ingres Server *"...we would not recommend it because of the showstopping multi-user bug we encountered."*

Gupta SQLBase *"...took an unthinkable 60 hours to load the tables and then crashed on the index builds..."*

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ATM

CONTINUED FROM COVER 1

ogy and downsizing, said Morris Jacobs, a senior manager at Ernst & Young's utilities consulting group in Atlanta. Their efforts stem from the 1992 Energy Act, which mandates that utilities allow the "wheeling" of power across their transmission lines to competitors. This means independent power producers can now provide competitive services for large customers.

Part of Northeast Utilities' cost-containment effort recently included reducing its 400-plus information systems staff by almost 60 people. Still, the company is marching ahead with its ATM plans, which will include the installation of two 155 bit/sec. ATM switches in Connecticut during the first quarter of next year. The nodes will represent upgrades from the company's StrataCom, Inc. T1 network to a backbone comprised of StrataCom's BPX ATM switches.

Competitive prices

The granular network reconfiguration and bandwidth allocation features inherent in ATM technology play into the theme of reducing operating expenses to help compete on price, ATM "allows me to very efficiently dynamically allocate bandwidth. This reduces the overall bandwidth needs we have by minimizing waste," Dixon said.

Northeast Utilities plans to upgrade two other StrataCom T1 nodes later in the year and eventually replace the 24 remaining T1 nodes with BPXs as fiber gradually gets installed, said Rich Kubica, manager of network planning and engineering.

The company is also looking at the Motorola Codex 6950 SoftCell ATM Networking Node switch for accepting many diverse incoming LAN interfaces and converting that traffic to ATM, said John Boyd, communications director [CW, Oct. 25].

Northeast Utilities' awakened interest in operations streamlining and customer service parallels the near-decade-old deregulation of the long-distance telephone market. "We're afraid what's happening with the phone companies will happen in the utilities," Dixon said. He was referring to customers' potentially turning to less expensive or more customer service-oriented suppliers.

Northeast Utilities

1992 financials:
Revenue: $3.2B
Profit: $256M

IS setup:
PCs: 6,200
RISC workstations: 25
Total number of desktop MIPs: 7,500

Cost savings from consolidating voice, video and data traffic onto one redundant network are key to price-based competition, Kubica said. Yet the goal is not to reduce overall communications costs but to "get the cost per megabit delivered down."

That is where ATM comes in, Kubica said. The IS department will be judged on the cost per megabit of network delivery to make sure costs are controlled, Dixon said.

More bandwidth

While Kubica said that "pure, raw bandwidth is what I need right now" — largely for aggregating traffic — he did cite several new applications that will also munch on network capacity. One is the creation of an image-based file for each Northeast Utilities customer.

Also, nuclear power plant support applications, geographical information systems of the utility's transmission facilities, videoconference-based training and corporatewide information kiosks are figuring into the bandwidth picture.

While ATM is being touted as the optimal technology for mixing voice, video and data, Northeast Utilities is already able to compress the mix "beautifully" on its StrataCom multiplexers, which run a frame-relay interface. However, the speeds only go up to T1 (1.5M bit/sec.), which cannot begin to sustain the utility's traffic volume.

While the plant doesn't expect many local-area ATM applications to emerge for a good 18 months, another appeal of ATM is that it "allows you to go from the desktop all the way through the WAN with a common architecture," which has management and cost-saving benefits, Kubica said.



“The move to the desktop by our mainframe-based clients is an excellent first step in the transition to client/server computing.”



Tim Nelson, Chief Scientist of System Development Environments, SHL Systemhouse.

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“With your own mainframe, you also save by deferring long-term upgrade costs. Productivity gains even continue after development is over, because you can test the end product to such a fine level of detail, the result is fewer defects during maintenance.”

“We find that the use of the COBOL makes it a lot easier for mainframe programmers to feel comfortable with the environment on day one. The interesting side-effect is that once they start to use the tools, they become more comfortable with the workstation and begin to explore how to get the best from it. It works out to be a very good way to transition from a mainframe-oriented programmer shop into something that can tackle client/server development.”

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Outsourcing

Air Canada floats $1 billion RFP, seeks cash

By Mark Halper

Information systems outsourcing may be shifting from mainframe to distributed computing, but a freshly printed request for proposals (RFP) from Air Canada demonstrates that one constant still applies in mega deal-making: Clients continue to seek cash up front.

The financially recovering $3 billion Montreal-based airline is seeking proposals for a seven- to 10-year $1 billion takeover of its information utility. The job includes client/server transition efforts and mainframe operation.

The outsourcer would also run LAN and database management, the help desk, application development and PC acquisitions and implement new technologies.

Two weeks ago, the firm sent RFPs to Electronic Data Systems Corp.; IBM's Canadian subsidiary, ISM Corp.; SHL Systemhouse, Inc.; and Bell Canada's Bell Sygma, Inc. arm.

Financial help, too

Given the expenditures required to migrate to a client/server environment, Air Canada is hoping as much for financial assistance as it is looking for technical help from its would-be outsourcer.

Air Canada eeked out a $43 million profit in its third quarter ended Sept. 30. It lost $454 million last year. In another cash-raising move, the company late last week issued $250 million in stock, lowering its debt/equity ratio from 31-to-1 to 7.6-to-1.



Experience counts

Air Canada is not new to outsourcing. Early this year it hired Andersen Consulting to build a Sun Microsystems, Inc.-based revenue management system; it also outsources computerized reservations to Gemini Automated Information Systems, a company it jointly owns with Canadian Airlines and Covia Corp. It is currently embroiled in court over Canadian Airlines' attempt to withdraw from that operation.

"One of the things we're looking for from an outsourcer is to help manage the cash requirements for us so we can move into the new environments and not have to bear the large up-front investments," said Norm Roberts, Air Canada's outsourcing project director.

Payroll, human resources, weather data and flight plans are among the dozen or so operations that Air Canada has earmarked for client/server architectures, and none of those will come cheap, Roberts noted.

"Human resources and payroll would cost about $5.5 million [Canadian], and there's probably 10 or 12 of those [applications]," Roberts said.

The eventual outsourcer would finance more than the client/server transition. The RFP specifies that the outsourcer would acquire computing, communications and possibly real estate, a move that would provide the airline with a much-needed cash infusion.

Roberts did not specify how much cash Air Canada is seeking for those assets. The sale of its computing resources would cover six mainframes — two IBM, three Unisys Corp. and one Bull HN Information Systems, Inc. machine — a private Bell Canada T1 communications network and some 4,200 PCs sitting on Novell, Inc. NetWare LANs.

Roberts said Air Canada expects to receive proposals by mid-December and to reach a decision by April. The company will also weigh a proposal from its own IS department.

The "lock, stock and barrel" RFP solicits outsourcers' plans for taking over "virtually every aspect of information processing," Roberts said.

The outsourcer would assist in dismantling the Bull HN mainframe that supports Air Canada's maintenance and inventory operations as well as some of its passenger revenue system, crew planning, scheduling, fuel and payroll.

Mainframe takeover

In addition, it would take over operations of the IBM mainframes that support general-ledger applications, some market planning, flight plans and frequent flier programs. It would run the Unisys systems that support Air Canada's integrated cargo booking system and take charge of backup and recovery.

Roberts said some operations are simply too data-intensive to move to client/server platforms in the forseeable future. For instance, some of the airline's marketing programs, as well as its flight planning operations that gather weather data from around the world, are wedded to mainframes.

The Air Canada RFP also asks the outsourcer to offer jobs to all of Air Canada's roughly 375 IS staff members and encourages the hiring of the 250 contract workers in its IS operations.

ISSC tapped to run railroad's systems

Business re-engineering proposals rejected in favor of processing plan

By Mark Halper
SAN FRANCISCO

Southern Pacific Lines last week ended its year-long-plus outsourcing evaluation by selecting a 10-year, $415 million bid from IBM's Integrated Systems Solutions Corp. ISSC got the nod over rival proposals that emphasized business process re-engineering.

The San Francisco-based rail company tapped ISSC to take over mainframe operations, application development, new technology implementation and disaster recovery.

The pact marks the first major outsourcing deal in the railroad industry, and others are expected to follow as rail companies seek technology leverage that would improve interrail logistics and ward off trucking industry competition.

Bids on the table

In a related development, sources noted that IBM is making a bid to acquire the railroad's sister company, SP Telecommunications, Inc., from parent company Anschutz Corp. in Denver and that cash from that transaction could help finance the outsourcing deal.



Southern Pacific's Tom Mathews *says most IS staff jobs will be transferred to ISSC*

Safety benefit

By transferring the data center from San Francisco to ISSC's Boulder, Colo., site, Southern Pacific is removing its mainframes from a major West Coast fault line.

ISSC will offer about 300 of the 350 Southern Pacific's information systems staffers jobs, according to Tom Mathews, Southern Pacific's vice president of administration. Most of them will remain in San Francisco; mainframe operators will be asked to relocate to ISSC's Boulder, Colo., data center.

ISSC will initially run existing operations as they are while it identifies areas in need of a technology overhaul.

More information

Those areas are likely to include car and locomotive tracking and scheduling processes. Under current mainframe procedures, yard masters do not have as much access to information about train location and cargo content as they could have in a client/server arrangement, explained Roy Carlson, Southern Pacific's vice president of MIS.

"The mainframe is a big sucking machine pulling all the data in and spitting it out according to what inquiries have been programmed," Carlson observed. A client/server program would not only provide readier access to data stored locally, but would permit yard workers greater manipulation of the data to determine availability of cars and engines, he explained.

While ISSC may develop client/server processes on its own, it may also purchase technology from other railroads that are marketing their own modernized systems. Union Pacific Corp., for instance, is offering a car and locomotive tracking system.

Rejected bids

Southern Pacific rejected a bid from Perot Systems Corp. that had included a large dose of corporate restructuring, an approach that is becoming a Perot trademark. Likewise, Southern Pacific turned down an Electronic Data Systems Corp. bid that pitched a good deal of re-engineering, according to Bill Mullin, an Annapolis, Md., consultant who advised Southern Pacific.

"Business process re-engineering might be very important to the company, but there's always the question of how much your corporate culture can absorb at any one time," Carlson said. "Also, it's an investment."

Corrections

Due to a reporting error, a story in the Nov. 8 issue incorrectly stated the responsibilities of Richard Wonder at Robert Half International, Inc. Wonder is national director of the information systems division and is actively involved in recruiting.

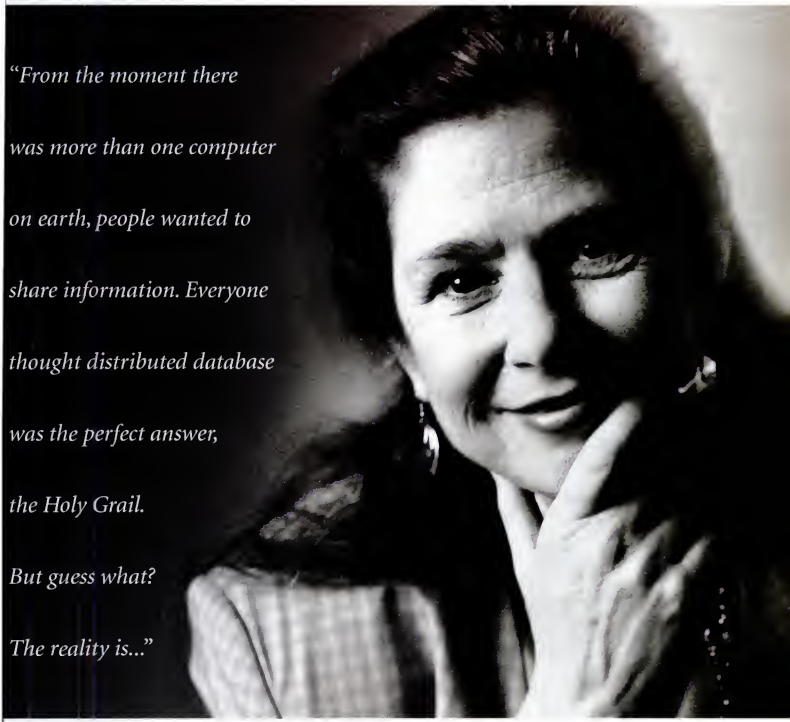
Due to a reporting error in a recent story [CW, Oct. 18], it was omitted that minorities and women hold several high-level management and professional positions in the 150-person systems department at Elf Atochem North America, Inc. Elf Atochem is a corporate sponsor of the Black Data Processing Association.

A story on Team Software, Inc.'s discussion database for Windows was pulled from page 4 of the Nov. 8 issue to make room for a late-breaking story. It is on page 75 of this week's issue.

Due to a reporting error in the Nov. 8 issue, QuarkXPress' supplier was incorrectly identified. It is owned by Quark, Inc.

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Users must upgrade to get IBM parallel goods

By Johanna Ambrosio
NEW YORK

IBM executives last week confirmed that only about one-fifth of the ES/9000 base will be able to connect to forthcoming System/390-based parallel processing machines because of technological limitations.

As a result, those customers will have to choose between buying most of the new parallel computers as stand-alone processors or upgrading to newer ES/9000 models in order to access the new parallel capabilities.

While IBM did provide more technical details, it will not make available pricing or performance data — or the parallel processors — until next year. These limitations may narrow their appeal.

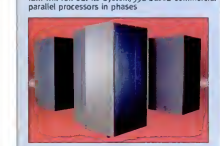
"I don't see it fitting into our place in the immediate future," said Albert Collins, vice president of information services at Home Box Office, Inc. in New York. "We'd have to get a whole new mainframe."

Still, many observers noted that IBM sent a second message informing customers that they will be able to move to the parallel machines with most of their software and applications in place.

"This makes a lot of sense," said Steve Josselyn, an analyst at International Data Corp. in Framingham, Mass. "You don't have to change applications or do a lot."

Down the road

IBM will roll out its System/390-based commercial parallel processors in phases



Q1 1994
- A 48-engine DB2 query machine. Includes new versions of DB2, MVS and other software.

Q2 1994 (pictured)
- A 48-engine transaction processing computer. First implementation supports the DL1 database management system (also known as IMS) and either CICS or the IMS transaction monitors.

1995
- A second version of the query machine that can either stand alone or be attached to selected ES/9000 mainframes. It may also support other IBM databases and non-IBM databases.
- A new transaction server that can support DB2.

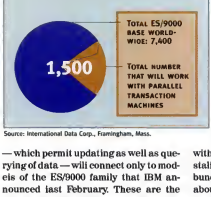
In good hands

Allstate Insurance Co. in Northbrook, Ill., which was the development site for the transaction server, has more than 10% of its claims processing running on a prototype machine. Donny Lippard, director of information technology at Allstate, characterized as "trivial" the 30-day effort his shop needed to change the application to run on the new machine. In essence, he said, the company needed to remove a parameter of the program that required the job to run on a specific processor.

As expected, first out of the parallel chute will be a 48-processor query engine that can connect to any Escon-capable processor built around advanced CMOS technology [CW, Nov. 8]. Subsequent versions of that machine, as well as all of the parallel transaction servers — which permit updating as well as querying of data — will connect only to models of the ES/9000 family that IBM announced last February. These are the so-called 511- and 711-based processors.

You can't get there . . .

Most existing ES/9000 customers will not be able to tie their machines into IBM's new parallel transaction boxes



Source: International Data Corp., Framingham, Mass.

Company executives insisted the decision to connect the parallel machines to only these ES/9000 models was based on the technical limitations of the older machines. "We just couldn't use the older machines," said Nick Donofrio, senior vice president of IBM's large systems group. "They can't support the speeds and densities we need."

Key to the transaction server is technology called the Coupling Facility, which will also be used in later versions of the query machine. This hardware/software combination will track which data is being used at any particular time so two users do not unwittingly call up and change the same piece of information at once.

Data sharing is another important concept going forward and one that IBM executives said differentiates their parallel processors from others on the market. In this scheme, the processors in the parallel computer can access all data.

Also new in IBM's parallel world is load balancing. This allows the machine to automatically adjust each processor to achieve the performance objectives of the user organization. With each transaction server, IBM will include a systems management package that allows users to point and click on icons to bring a machine down or repower processors.

Both the transaction server and the query machine will be bundled with software, storage devices and installation services. Most analysts peg the bundled price at about $20,000 per MIPS, about half that for a regular ES/9000 mainframe.

By 1996, there will be enough additional functionality on the transaction server — including DB2 in 1995 and VSAM after that — to allow it to take over as the core machine in IBM's mainframe lineup. Although IBM will devote most of its large systems research dollars to these CMOS processors, additions to the traditional bipolar host family will continue, Donofrio said.

Charlie Burns, an analyst at Gartner Group, Inc. in Stamford, Conn., said he expects both 9- and 10-way ES/9000 models to be announced in February.

Applications

NCR readies parallel software for multiprocessing systems

By Thomas Hoffman
NEWYORK

NCR Corp. is formulating a program designed to widen the availability of commercial "parallelized" software applications that will run on its multiprocessor machines.

Word of the plan, called Genesis, came last week when the company showed off hardware and software enhancements to its 3600 massively parallel processing system and Teradata DBC/1012 database servers. The plans include first-quarter 1994 availability of Intel Corp. Pentium microprocessor upgrades to NCR's i486-based 3600 and DBC/1012 application processors [CW, Nov. 8].

The software effort, which combines in-house and third-party development, is in response to customer and prospective user grumblings over the lack of off-the-shelf parallel applications. Most massively parallel processors are Unix-based and as such are equipped to run Unix applications, but the bulk of those applications have not yet been optimized to run across dozens, even hundreds, of parallel microprocessors.

Since June, NCR has been working with third parties to create customized software for its six key target markets: financial/insurance/banking, retail, manufacturing, transportation, telecommunications and public sector.

Genesis is a key ingredient of the customer-focused team concept NCR introduced last month as part of a company-wide reorganization. The program's aim is to deliver both parallel and nonparallel vertical-specific applications to target markets, said Mike Mason, a team member of the Genesis group.

Mason said NCR is working with two software vendors he declined to name to create client/server-based parallel marketing software for its 3600 machines. Though he would not name the software partners, Mason did say the initial packages, slated for January delivery, would be designed to run in Teradata and Oracle Corp.'s Oracle 7 database environments, followed eventually by Sybase, Inc.-compatible versions.

Meet the specs

But the only major requirement imposed on applications vendors seeking to run their software on NCR's massively parallel processors is to comply with the Teradata and Oracle database specifications, according to Elaine Meis, an NCR assistant vice president.

NCR's support of several SQL gateway technologies helps to smooth that path, Meis said. For example, NCR supports Oracle's SQL/Connect, Micro Decisionware, Inc.'s MDI, Apple Computer, Inc.'s Data Access Language, Gupta Corp.'s SQL/Router and Microsoft Corp.'s Open Database Connectivity gateways, among others.

While some NCR 3600 customers said they are interested in viewing the vendor's parallel applications offerings, other users have taken matters into their own hands. "Most of our major [purchasing] applications are in the process of being replaced or rewritten using Oracle 7," said Forrest Grapes, manager of technical services at Kansas City Power & Light Co., a Kansas City, Mo., utility that installed an NCR 3600 system to replace a Unisys Corp. 2200 mainframe.

In the beginning

As part of its Genesis program, NCR last month completed an extensive five-month worldwide study of 600 NCR and non-NCR customer accounts whose operations make them prime targets for massively parallel processing systems.

NCR's parallel application development efforts, however, still lag those of Thinking Machines Corp. and Intel, according to Derek Stubbs, a consultant at Advanced Forecasting Technologies, Inc., a Vicksburg, Mich., consultancy. In contrast to NCR's approach, Thinking Machines and Intel have been building their own packages without third-party help, Stubbs said.

Informix plots

CONTINUED FROM COVER 1

applications analyst at Citicorp Mortgage, Inc., an Informix customer that has evaluated offerings from Sybase and Oracle.

The St. Louis division of Citicorp plans to move a mission-critical mortgage banking application off a Pick Systems platform to a Unix multiprocessor.

"Users want faster processing of more and more complex queries against ever larger databases. The only way you can do this is parallel processing," said Dave McGoveran, president of Alternative Technologies, Inc. a Boulder Creek, Calif., consultancy.

Also on the agenda are management tools, such as network monitoring and planning capabilities built into the OnLine database. Such products would help users set up and track client/server configurations.

Taking the leap

Hot spots to watch when migrating to parallel processing-enabled OnLine 6.0:

- Archive copy of Version 5.0 database will not automatically run under 6.0.
- OnLine 6.0 will not include many performance planning tools; utilities will ship separately.
- Migration will take 30% to 50% longer than moving from 4.1 to 5.0.

Dynamic Scalable Architecture will also feature the ability to automatically reconfigure the space available in the database as information is moved, inserted and deleted. The next version, 6.1, is expected to implement Parallel Database Query, which breaks down a complex end-user query into several chunks and distributes them to available processors.

Informix declined to comment.

Sybase last week formally unveiled a similar technology, dubbed Navigation Server [CW, Nov. 8]. Oracle plans to add its own parallel query processing features in early to mid-1994, the same time frame in which the Informix and Sybase products are expected to ship.

Beta testing of OnLine 6.0 is slated to start at the end of the month, with delivery scheduled for two longtime Informix users, said another Sequent employee, Afsaneh Eshghi, program manager for the Informix relationship.

Migrating from OnLine 5.0 to Version 6.0's Dynamic Scalable Architecture "won't be as jarring as going to Sybase or Oracle parallel databases," McGoveran said. Oracle, for example, approaches parallel processing through a loosely coupled architecture, meaning that the database and applications must wend through separate machines tied together, he explained. Informix parallelism, which is based on tightly coupled systems, is less of a leap from a traditional uniprocessor platform, he said.

ASK enhances Ingres database

The ASK Group, Inc. plans to announce today object-oriented and connectivity enhancements to the Ingres database, features designed to kick new life into what some observers call a stagnant product line.

Renamed OpenIngres, the follow-on to Ingres 6.4 will include support for binary large objects, Open Database Connectivity standards and a distributed transaction processing monitor, the company said. The products are slated to ship in April 1994.

Ingres' share of the $2 billion worldwide Unix database market has virtually stood still for the past three years, according to International Data Corp. in Framingham, Mass. With a 1992 stake of 9%, the product stands a distant fourth in share, behind Oracle Corp.'s 44%, Informix Software, Inc.'s 18% and Sybase, Inc.'s 12% slices.

ASK hopes to sign up systems management tool makers such as Legent Corp. and BMC Software, Inc. to port backup and recovery and other utilities to Ingres, said Beverly Brown, vice president of product marketing.

Also part of OpenIngres is a gateway to IBM CICS/VSAM systems and a database replicator announced in June.

— Kim Nash

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Big boys parry, thrust for 32-bit advantages

By Ed Scannell

Trying to get to "Chicago" before Microsoft Corp. does, IBM's Personal Software Products group last week formally announced OS/2 for Windows, software that gives Windows 3.1 users all the 32-bit advantages of OS/2.

The new version, which contains all the functions of OS/2 2.1, can be installed directly over existing versions of Windows 3.1 without changing a user's existing hardware or software configurations [CW, Sept. 13].

With Microsoft not expected to deliver Chicago — a 32-bit version of Windows for the desktop — until late next year, IBM believes OS/2 for Windows is its best chance to yank away a good hunk of Microsoft's desktop operating system market share.

Microsoft officials in recent weeks have declined to comment on OS/2 for Windows except to say that they strongly suspect it will not satisfactorily work with Windows for Workgroups 3.11, which shipped last week. Specifically, they said OS/2 for Windows will not support the 32-bit virtual device drivers in their product.

Personal Software Products countered by saying that it will announce at Comdex/Fall '93 support for Microsoft's Win32s application programming interface, which should make OS/2 for Windows compatible. IBM declined to say when the OS/2 2.x series would gain Win32s compatibility.

IBM declined to discuss how OS/2 for Windows will seamlessly attach itself to Window 3.1 without any Windows source code.

"We hope to deliver [in OS/2 for Windows] what Microsoft promised but failed to do for Windows users," said Lee Reiswig, president of Personal Software Products.

To attract as many Windows 3.1 users as possible in the next few months, Personal Software Products is pricing the program at $49 until Feb. 9, 1994.

Reiswig said OS/2 for Windows should double the current monthly run rate of OS/2 2.1 beginning this month and extending to the first quarter of next year.

IBM officials also declined to discuss precisely how OS/2 for Windows will seamlessly attach itself to Windows 3.1 without the presence of any Windows source code. But they said they are confident the techniques used in the product do not violate the "divorce settlement" between IBM and Microsoft signed in June 1992.

NT starts slow

CONTINUED FROM COVER 1

tems and IBM are delivering solutions and capturing market share."

His observations appear to be backed up in a recent survey of *Computerworld*'s Premier 100 user companies.

Among the 238 respondents from large corporate accounts interviewed by the *Computerworld* Database Division, only 26% have even tested NT. Moreover, consistently more of these users see themselves as unlikely to standardize NT on either the desktop or server (see chart cover 1).

Most of the 2,500 to 3,000 MIS managers and chief information officers interviewed by WorkGroup Technologies for a series of surveys indicated they are still in the evaluation stage. "There is a high degree of awareness and interest in NT, but we couldn't find any substantial or immediate deployment plans or implementations," Donovan said.

The Top 6 pieces of NT advice users would like to give Microsoft

1. Improve support and documentation.
2. Cut down NT's overhead and memory requirements.
3. Cut back on the need for debugging.
4. Improve interoperability between systems.
5. Improve performance and speed.
6. Don't set unrealistic deadlines.

Source: *Computerworld* survey

Fast out of the gate

Moreover, while Microsoft claims to have shipped 200,000 copies of Windows NT in its first 60 days of commercial availability, a leading national software distributor said dealer requests from NT fell sharply in October after it filled a substantial number of back orders.

"OS/2 is cleanly beating NT for now," said an executive at one major distributor who requested anonymity. "OS/2 has been around for a while, and some IS types are getting more comfortable with it," she said.

This all adds up to a warning for Microsoft. The company is faced with convincing corporate America that Windows NT is a better print and file server than Novell's NetWare and a better applications server than Unix.

The product may accomplish both in the long term, but Microsoft has a long road to travel to get there.

While there are many corporate accounts proceeding with due caution, some have faith Microsoft and its partners will deliver a richer variety of development tools and utilities.

"[Windows NT] doesn't have nearly the number of utilities available you can get for NetWare. It is probably 10 to 1 right now. But as Microsoft gets more copies of NT out there, people will start doing more things like utilities," said Bill Cornfield, president of the New York-based Windows Support Group.

Full speed ahead

Some corporations are already proceeding with the development of mission-critical applications that will tie in with their existing Windows 3.1 applications. Companies that are either standardizing on NT or already deploying the product in various areas are Nordstrom, Inc., Bank-America Corp., Sanford C. Bernstein & Co., Freightliner, Inc. and Paragon Trade Brands, Inc., among others (see story below).

Fence-sitting users, on the other hand, want to see more development tools and many more 32-bit server and desktop applications that fully exploit NT's power. As did OS/2 proponents three or four years ago, information systems departments today contemplating NT need to show their bosses proof of productivity gains before they can justify more widely deploying Microsoft's 32-bit offering (see chart). Even Microsoft is not expected to deliver 32-bit versions of Excel and Word until first-quarter 1994.

"It's not so much waiting and seeing if [Windows NT] succeeds as much as it is waiting to see when the 32-bit applications come," said Mike Drips, an NT beta user and consultant in Tampa, Fla. "Corporate departments are going to need a lot of them to justify large purchases."

"NT does not bring much to the table now," said one corporate beta user of the product. "But with enough supersonic applications, managers will be more likely to buy off on it across the board. That is where our bottleneck is right now," said another beta tester at a major Midwestern telecommunications company.

One stumbling block to getting major developers to create fully exploitive 32-bit applications is that many are just now beginning to realize significant profits from their Windows 3.1 applications. Some may be reluctant to quickly begin another major development project.

Please come to Chicago

"Why would [independent software vendors] want to do another expensive rewrite, with Chicago [the 32-bit Windows version] coming right behind NT?" asked Bill Bluestein, a senior analyst at Forrester Research, Inc. in Cambridge, Mass.

Rich Tong, Microsoft's general manager of corporate and network systems, responded that "some companies, like Microsoft, will release 16-bit OLE-enabled apps and then do 32-bit versions. Others will use Win32 [application programming interfaces] to go to 32 bit and still be able to run [their applications] on systems running both Windows 3.1 and Windows NT."

Microsoft will showcase dozens of software developers demonstrating 32-bit, NT-based applications at Comdex/Fall '93 (see stories pages 16-29) this week. At this week's show, company officials are expected to announce that 220 applications are now shipping that take advantage of Microsoft's Win32 APIs.

However, a richer variety of 32-bit applications from each of the major applications categories is not expected to be available until next year.

Environmental differences

Users gave Windows NT higher interoperability marks than OS/2 and Unix but were less positive in other categories

	NT	OS/2	UNIX
INTEROPERABILITY	3.7	2.8	3.0
FEATURES	3.7	3.2	3.5
USER FRIENDLINESS	3.7	3.1	2.1
MANAGEABILITY	3.6	3.4	2.6
PERFORMANCE	3.2	3.3	3.9
COST-EFFECTIVENESS	3.2	3.4	2.8
SERVICE AND SUPPORT	3.0	2.7	2.8

Computerworld survey

Customer apps take bow on NT stage

Looking to give its fledgling Windows NT effort a little boost, Microsoft last week demonstrated several custom applications developed by information systems shops that integrated Windows clients with NT servers.

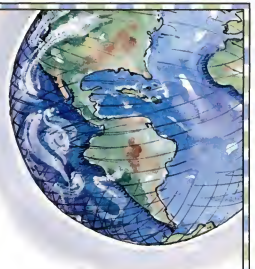
Highlighting customer applications from Freightliner Corp., Paragon Trade Brands, Inc. and Voist Alpine, Microsoft executives stressed Windows NT as a credible server platform capable of running native 32-bit applications that share the same set of application programming interfaces as Windows.

This capability will translate into substantially lower maintenance costs compared with mixed environments where Windows clients are supported by Unix or OS/2 servers, according to John Lazarus, vice president of systems strategy at Microsoft.

At the same time, Microsoft reiterated its plans to build more robust system services on top of NT. They include an Electronic Messaging Server that will provide an intelligent electronic-mail backbone with facilities for finding documents on the network and a distributed system management facility called Hermes.

In addition, Lazarus stressed that Microsoft Office 4.0, which includes a programming language, will function as a platform for integrating third-party PC applications into the Microsoft client/server model.

—Michael Vizard



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The PowerPC is coming soon t



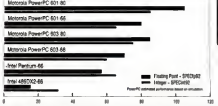
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— Jerry Barber,
Chief Technical Officer,
Aldus Corporation.

of its 15-year-old architecture, the streamlined PowerPC architecture is just getting started.

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Borland weighs in on office suite role

By Michael Vizard

Borland International, Inc. will take the stage at Comdex/Fall '93 this week to announce plans to integrate its Object Exchange (Obex) facility, which makes it easier to integrate data across applications, into WordPerfect Corp.'s word processor packaged with Borland Office 2.0.

Borland will also talk about long-range plans for providing a common macro language that can address all elements of the suite and will showcase some of the work being done to give Borland and WordPerfect products a more common look and feel. Then Borland will look to invite other software vendors to support Obex and Borland programming tools.

But industry analysts said they doubt Borland will make any substantial headway in this category against the dominance of Microsoft Corp. and Lotus Development Corp.

"I'm skeptical because there are degrees of integration. Lotus has SmartIcons, while in Microsoft Office all the applications literally look the same," said Mike Heylin, an analyst at Creative Strategies, Inc. in San Francisco.

"Only people who have a mission-critical need for Paradox are really going to look at the Borland suite," said Krystyna Filistowicz, an analyst at Dataquest, Inc. in San Jose, Calif.

Meanwhile, Microsoft and Lotus will be pushing their respective suite stories at Comdex. Microsoft will demonstrate 35 third-party applications that support Object Linking and Embedding (OLE) 2.0 and Visual Basic.

Under the Microsoft model, information systems managers can drive these third-party applications from within the Excel spreadsheet and Word word processing package in Microsoft Office.

Lotus, meanwhile, plans to map out a similar strategy for its SmartSuite offering that calls for integrating a common macro language and OLE 2.0 support.

"OLE 2.0 isn't going to be a slam dunk just yet. But you will see vendors begin to expoit it on your behalf. Full tribute to OLE 2.0 will be paid over time," said David Coursey, editor of the industry newsletter "PC. Letter." (see story page 29).



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WordPerfect to buy into document software

By Michael Vizard

Looking to jump ahead of its major rivals, WordPerfect Corp. last week agreed to acquire SoftSolutions Technology Corp., a document management systems provider in Orem, Utah. The terms of the deal were not disclosed.

WordPerfect hopes to get a leg up on both Microsoft Corp. and Lotus Development Corp. as the PC applications arena moves toward compound document architectures using object technology, noted Priscilla Emery, an analyst at New Science Associates, Inc. in Wesiport, Conn.

Earlier this year, Microsoft divulged its intention to deliver a document management system. Lotus is pursuing a course that invites third-party suppliers to layer their offerings on Notes [CW, Oct. 11].

The plan

WordPerfect's strategy calls for adding some elements of the SoftSolutions technology to the company's namesake word processor and then linking that technology to WordPerfect Office.

This effort will satisfy demand for a document management system while buttressing the firm's workgroup computing strategy, said David Moon, vice president of technology at WordPerfect.

Meanwhile, SoftSolutions will be able to leverage WordPerfect resources to keep up with its own growth, which users said has begun to outpace the firm's ability to provide support (see story page 76).

SoftSolutions will also be able to tap WordPerfect's marketing resources to counter efforts from PC Docs, Inc. in Tallahassee, Fla., and Saros Corp. in Bellevue, Wash. But Moon stressed that SoftSolutions will remain an independent business unit of WordPerfect.

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IBM humanizes PCs

CONTINUED FROM COVER 1

a command and control component, some intelligent agent technology and a two-dimensional version of the conversational surrogate. IBM officials said they hope to see third parties offer their own agents and surrogates as well.

IBM is also close to finished with a PowerPC Reference Platform (PREP), a 184-page document used for developing a PowerPC clone. PowerPC partner Motorola, Inc. is helping to create PREP, though partner Apple Computer, Inc. is not. IBM also plans to sell PowerPC components and will even sell full systems to vendors wishing to remarket them.

PREP was designed to make PowerPC systems as widely available as possible and to encourage software makers to build applications for the processor, said Richard A. Guardino, Power Personal Systems Division general manager.

"We want to seed another PC-compatible market," he said. IBM officials said that by opening the reference designs, IBM hopes to immediately create a stable PowerPC clone market, unlike the two to three years it took for the clone market to stabilize around the IBM PC AT.

While saying that IBM could foster a new standard without Apple's clear support, Guardino conceded that "if they come with us, it'll help us."

Apple officials refused to comment on their plans for the PREP design, but observers said the company is engaged in a "gut-wrenching" process of ending its days as a proprietary vendor, which is expected to include supporting PREP. As part of this, Apple will make the Macintosh operating system generally available to PowerPC vendors next year, according to sources close to Apple (see story at bottom).

Meanwhile, Microsoft Corp. and Motorola officially announced last week that Windows NT will be ported to PowerPC [CW, Nov. 1]. This week, Sun Microsystems, Inc.'s SunSoft unit will announce a PowerPC port for Solaris. With AIX, WorkPlace OS, Taligent, Inc. and OS/2 either running on or planned for PowerPC, the chip is building broad operating system support.

The moves should give PowerPC significant momentum, observers said.

Down the road, PowerPC systems will blend computing and telephony technologies, IBM officials said (see chart below). The geo-whiz aspect of the interface, which uses intelligent agents to convert verbal commands to machine languages, leaves users skeptical, though some said they are open to the possibilities.

"We'll have to wait and see," said Justin Alexander, manager of advanced technology at SmithKline Beecham, Inc. in Philadelphia. "My previous experience with voice-activated systems suggests it won't work."

John Woods, a PC systems specialist at Chevron Information Technology Co. in San Ramon, Calif., said, "We'll test PowerPC systems next year. I think voice recognition is neat and . . . I think it could help Chevron. If you can make the user interface as user-friendly as possible — a lot easier to drive than VCR or phone mail — it could allow the professional worker to spend more time thinking and less time doing the mundane tasks."

Stacking the chips

A *Computerworld* survey of 100 IS managers shows the fledgling PowerPC chip stands to post quite respectable sales next year

Intel 1486	69%
Intel Pentium	48%
Clone 486	26%
PowerPC	24%
RISC/SPARC	19%
RISC/Alpha	11%
RISC/Mips	11%
PA-RISC	7%
No plans	11%

Percentage of 100 respondents who plan to purchase those chips in 1994

Multiple responses allowed

IBM leads the pack

While the PowerPC will be built around standard PC components such as the Peripheral Component Interconneect, XT/AT bus and PCMCIA buses, its human-like features are driven by the floating-point properties inherent in RISC processors such as the PowerPC.

IBM's prowess and patience in human factors research — the company's voice-recognition project began 22 years ago — has it ahead of most competitors in the hardware realm. Apple is also developing intelligent agent technology, and Compaq Computer Corp. sells limited voice recognition on its DeskPro/I, but most vendors have nowhere near the skill of IBM in this realm.

"IBM is creating a market before competitors are even acknowledging its existence," said John Dunkle, president of WorkGroup Technologies, Inc. in Hampton, N.H.

— Michael Fitzgerald

Talking head



Once telephones are built into PCs, IBM's intelligent agent technology will enable users to ask Charlie to find a phone number. It will automatically search the database, find the number and make the call.

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Fiercely proprietary Apple Computer, Inc. is readying plans to license its operating system concurrent with the release of its first PowerPC-based PCs, due out in the first quarter of next year, according to sources close to the company.

Apple's System 7 operating system is expected to be renamed and marketed broadly for other processors and other versions of the PowerPC, said sources familiar with the company's plans. System 7 should run on Apple's PowerPC-based systems when those machines arrive in March.

Systems built thereafter are expected to use the PowerPC Reference Platform (PREP), a hardware design specification that is an attempt to make PowerPC a widely available and open standard (see story above).

Apple engineers have also been working since this spring on a modified version of System 7 that would run on DOS-based machines using Intel Corp.'s 1486 processor.

Apple, meanwhile, is expected to use Comdex/Fall '93 to introduce its Houdini technology, an Intel 1486-based board that can be popped into a Macintosh and can then run Windows. Houdini will work on most high-end Macintoshes and could cost as much as $800, sources said.

Sources said Apple's move is also driven by the Plug-and-Play effort led by Microsoft and Intel. That initiative aims to take away a key Macintosh advantage over the PC: its close integration of hardware and software.

An Apple spokesman declined comment, but insiders said company executives recently came to the conclusion that they must open up. "Deep in their hearts, they know they have to do it," one source said.

Compaq Computer Corp., NEC Corp., Sharp Corp. and Toshiba America Information Systems, Inc. are reportedly talking with Apple about making Macintosh compatibles targeted at niche markets that do not directly compete with Apple's current business, according to sources.

— James Daly and Michael Fitzgerald

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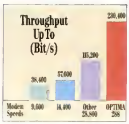
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Desert braces for desktop fest

Product avalanche will highlight development, processor trends with an emphasis on integration

By CW Staff

If show sponsor estimates of 170,000 attendees is on target, this week's 15th Annual Comdex may be the biggest yet. But with few major announcements on tap, most users will satisfy themselves with technology demonstrations and discussions, which will primarily emphasize some aspect of system or software integration, mobile computing, multimedia or application development.

Attendees with connections might find their way into behind-the-scenes briefings on forthcoming technologies such as Microsoft's Electronic Messaging Server, Hermes, Chicago and Cairo or Intel's 486DX3 machines.

Also expected to predominate at the Las Vegas confab are applications supporting OLE, a raft of 486 clones and laptops, Cellular Digital Packet Data wireless technology, multiprocessor machines and network management announcements focusing on Windows NT and Hermes.

Comdex will also feature the Las Vegas OS/2 User Group; the Video Electronics Standards Association ("Demystifying 3-D Technology"); the Association of Personal Computer User Groups, which among other things will present the 1993 Data Preservation Awards; and the fifth annual Micrograf x Chili cookoff.



Cort Conley

The Las Vegas Convention Center, *one of the sites of Comdex/Fall '93*

The chili cookoff, Tuesday night at the Thomas & Mack Center, is in its third year raising money for the National Center for Missing and Exploited Children. Tickets are $50 for a Texas hoedown that attracted 9,000 last year.

Sponsors expect 170,000 attendees — the largest crowd ever.

The sprawling desktop technology conference will feature 2,200 vendors spread out over two convention centers and two hotels — Bally's and the Hilton — in a city where cabs are at a premium. Show highlights include a Monday morning keynote at The Aladdin Hotel by Apple's Michael Spindler; 90 seminars spread out over five tracks, including Corporate Solutions; and three vendor CEO perspectives.

Comdex has traditionally formed a stage for operating system fireworks between market leaders Microsoft and IBM. This year's joust should be fairly low-key as both vendors concentrate on demonstrating products designed to boost growing sales momentum for OS/2 and NT (see stories pages 1 and 29).

Microsoft will next week demonstrate a range of third-party tools at Comdex and together with Intersolv will announce the upcoming gateway between Visual Basic and intersolv's PVCS version control software, industry sources said.

IBM will announce Ultimedia Video IN/2, OS/2 Version 2.1 software that enables users to capture, store, manipulate and play video clips taken off a camcorder, VCR or laserdisc player, according to a preliminary IBM release.

PC hardware strategies

Users adjust to market dynamics

By Michael Fitzgerald

■ The PC hardware sector is just now moving back to technology basics after a year in which usability issues such as backlogs, faster product life cycles and ownership costs dominated the market, development efforts and purchasing strategies.

While technology did not exactly stagnate — note the advent of Intel Corp.'s Pentium processor, personal digital assistants and increased system integration — much of this year's news has centered on major vendors expanding their brand strategies, aggressively pursuing new channels and, for the first time in the 1990s, re-establishing market position at the expense of the clone makers.

Ferocious market battles have led to compacted product life cycles as short as six months, which in turn have meant big headaches for users deciding whether to buy or wait.

Steven Ades, director of information systems at States Nitewear, Inc. in New Bedford, Mass., said "it's hard to figure out where to jump in anymore because you might miss something [technology wise]."

Brian Ritberger, network engineer at the *Sacramento Bee*'s publishing systems department, pointed out that six-month product life cycles have outstripped the newspaper's depreciation cycles, slowing its ability to deploy new technology.

Customer complaint

Customers have complained that products are becoming obsolete almost before they can be approved for purchase. In response, IBM PC Co. and Compaq Computer Corp. have moved their respective PS/2 and DeskPro/M lines into a more sedentary life cycle. Both companies explained that large corporations want to roll out major, year-long projects with the same hardware from start to finish.

Vendors have also started to give more advance notice about future product plans, some users say, which allows for more effective planning.

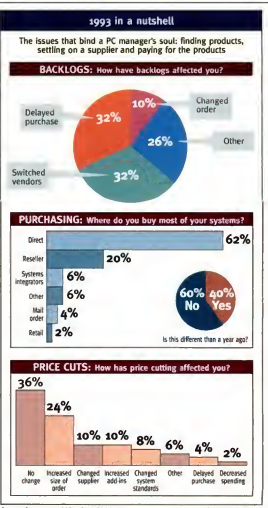
The re-emergence of IBM, Compaq and Toshiba America Information Systems, Inc. as aggressive competitors has also made many corporate buying processes shorter. Users say they have turned away from testing large numbers of vendors in every buying cycle and are instead going with a short list of well-established companies that look sure to survive.

Despite the price wars' rattle and hum, a recent *Computerworld* Database Division survey showed that only 10% of companies switched vendors because of pricing in 1993. Backlogs, however, caused some 32% to change vendors, though many users who shifted sales from a top-tier supplier said they planned to go back to that vendor when it could deliver products.

The price wars, meanwhile, have subsided into skirmishes this year: The more than 50% drops seen in 1992 have settled into a more normal 15% to 20% range. "It would've been nice to see the price wars continue," Ritberger sighed.

1992's highest-end system was a 33-MHz 486DX with 4M bytes of RAM and a 120M-byte hard drive for $3,189. A mainstream system in 1993 offers a 33/66-MHz 486DX2 with 8M bytes of RAM, a 200M-byte hard disk and a local-bus or graphics accelerator for $2,800.

Continued on page 29



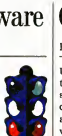
Source: *Computerworld* Database Division

CW Chart: Dave Marshall

Windows, wireless, portables set pace

System software

By Ed Scannell



IBM will bring more ammunition to its annual desert shoot-out with **Microsoft Corp.** when it shows today, for the first time, OS/2 for Windows. The Windowless version of OS/2 2.1 frees IBM from paying royalty fees to Microsoft.

Also known as "Ferengi," the product lets Windows 3.1 users simply layer it on top of their systems without changing any of their hardware or software configurations [CW, Sept. 13].

Look for Microsoft to claim that OS/2 for Windows is not fully compatible with Windows for Workgroups and therefore remains a moving target for IBM's claim of providing "a better Windows than Windows."

Microsoft will counterpunch with one of its first public demonstrations of Windows for Workgroups 3.11. At the formal unveiling last week, Microsoft said several large OEMs would bundle Version 3.11 in place of its best-selling Windows 3.1 [CW, Oct. 4]. But most of Microsoft's time will be spent hawking Windows NT.

At today's press briefing, Microsoft will provide an update on the "first 100 days of NT distribution."

Showgoers curious about 32-bit operating systems will find the show floor littered with the following:

▶ Almost 180 software developers will show Windows NT applications and tools alongside value-added resellers and OEMs that take some advantage of the 32-bit operating system.

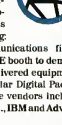
▶ A "Scalability Wall" in the Microsoft booth will show the company's Windows family of products that can run on the lightest weight portables all the way to a 30-processor minicomputer from Sequent Computer Systems, Inc.

▶ Also in the Microsoft booth, a **Digital Equipment Corp.** co-hosted demonstration will show Windows NT running programs from 40 software developers and working on clients and servers.

▶ IBM will sponsor an OS/2 vs. Windows NT shoot-out at a Wednesday morning breakfast.

Communications

By Lynda Radosevich



Users trying to weave together and manage stationary and portable devices with wired and wireless networks will find some answers at Comdex/Fall '93. Contributing to the wireless buzz are the following:

▶ Eleven telecommunications firms will gather in the GTE booth to demonstrate soon-to-be-delivered equipment using wireless Cellular Digital Packet Data technology. The vendors include **AT&T**, **Motorola, Inc.**, **IBM** and **Advantis**.

▶ **Xircom, Inc.** has rounded up executives from **IBM**, **Microsoft Corp.**, **Compaq Computer Corp.** and **SystemSoft** for a Tuesday morning discussion of issues facing PCMCIA-equipped portable users at the Las Vegas Country Club; there will be demos.

▶ San Antonio-based modem maker **Data Race** will introduce wireless PCMCIA adapters, software and repeaters said to let users roam the office and connect to Ethernet LANs to transfer and synchronize files between their laptop and desktop PCs without floppy disks or cables. Separately, **Ardis** will show a 19.2K bit/sec. network in its booth and others.

▶ **Intel Corp.** will demonstrate its mobile products, including wireless modems used to let Intel-based PCs send and receive messages via **Lotus Development Corp.**'s CC:Mail, **Microsoft**'s Mail and **AT&T**'s Easylink over **RAM Mobile Data** networks.

▶ Sources said **RadioMail Corp.** will unveil its wireless electronic-mail service for IBM ThinkPad users.

▶ **Digital Equipment Corp.** and **IBM** will announce NetView/6000 network management applications for managing Microsoft's Windows NT using the latter's Hermes Windows applications manager.

▶ **Dolphin Software Systems, Inc.** in Montreal will introduce a suite of software tools said to manage PC networks from a central host.

Hardware

By Michael Fitzgerald



The PC desktop bubbub rising from the Las Vegas desert this week will center around finally available **Intel Corp.** 60-MHz Pentium systems and Peripheral Component Interconnect (PCI) buses, subnotebooks and PCMCIA cards. Adding their two cents will be RISC chip makers announcing new PC customers.

▶ **Pentium.** While Intel continues its struggle to produce its 66-MHz Pentium chip, 60-MHz Pentiums are widely available. **IBM PC Co.**, **Compaq Computer Corp.** and **Dell Computer Corp.** now have the chip in volume and are readying systems. Dell, for example, will unwrap the Pentium-based Dimension V XPS along with a Pentium version of its OptiPlex desktop line [CW, Oct. 18]. Pentium systems still appear to be priced 50% above the Intel 1486.

▶ **PCI.** Many of the new Pentium systems will appear with Intel's PCI high-speed bus. IBM's **Ambra Computer Corp.** subsidiary will introduce its first PCI system, the DP60 PCI, priced at $2,799. Look for other PCI introductions from IBM PC Co. and **AST Research, Inc.**, among others.

▶ **Subnotebooks. Olivetti Group** will add Analog Devices, Inc.'s digital signal processor to its Quaderno subnotebook today. Numerous vendors announced subnotebooks last week. They will be on display for the first time at Comdex/Fall '93, where the Taiwanese cloners are also expected to be out in force. Look for new subnotebooks from **Toshiba America Information Systems, Inc.** and **Hewlett-Packard Co.**'s OmniBook 425 to lead the way. **Epson America, Inc.** will also show three models of its ActionNote 700, a full-size notebook that weighs in at a subnotebook-like 4.4 to 4.9 pounds.

▶ **PCMCIA.** PC cards that map to the PCMCIA standard will blanket the show floor. Announcements will include **Apex Data, Inc.**'s Ethernet adapter and **MagicRam**'s SCSI adapter. Epson America will also introduce memory cards.

Applications

By Michael Vizard



Comdex/Fall '93 attendees will find software vendors serving up a raft of multimedia applications, help desk management and Object Linking and Embedding (OLE)-compliant intentions.

Besides the usual flock of OS/2 and Windows applications demonstrations near the **IBM** and **Microsoft Corp.** booths, the following will be on tap:

▶ **Lotus Development Corp.** is looking to take multimedia applications mainstream with the release of a multimedia edition of its 1-2-3 spreadsheet for Windows. The product features a SmartHelp facility that provides an animated guide through 1-2-3 and an audible proofreader. Also featured is a ScreenCam utility that captures screen activity, cursor movements and sound into a file that can be shared. Pricing for the multimedia edition of 1-2-3 is $495.

▶ **SPSS, Inc.** in Chicago will show one of the first application development tools that supports OLE 2.0. Priced at $495, the kit was designed to make it easier to integrate applications with SPSS' statistical analysis software, which will support OLE 2.0 in a forthcoming release.

▶ The only available non-Microsoft application that complies with the OLE 2.0 specification is the Visio charting and drawing tool from **ShapeWare Corp.** in Bellevue, Wash. It will be on display with more than 30 forthcoming OLE 2.0 third-party applications in the Microsoft booth.

▶ **Magic Solutions, Inc.** in Mahwah, N.J., will preview an innovative help desk package for Windows that features statistical information-retrieval tools that can identify calls stored in a database that have similar problems.

▶ Also on display will be a database from **Micro-Frame, Inc.** in Ontario, Calif., for users of Microsoft Project management software. The idea is to bring workgroup computing to project management using a centralized database.

Users may not be thrilled by the demise of price wars, but one benefit has been fewer backlogs. The price wars caused huge backlogs that some vendors never fully caught up with, creating ironies such as the PC Co. introducing its third-generation notebooks before some users and resellers had seen the first generation.

Money tends to buy more now, though, than it did a year ago. The 486SX is now the base processor for all systems, save handhelds. Although this will be status quo through 1995, Intel's luxurious reign alone atop the 486 world should end, as competitors such as Advanced Micro Devices, Inc. and Cyrix Corp. expand capacity next year.

One change in 1993: Vendors now at least pay lip service to the notion of developing technology in order to meet customer needs, rather than for the sake of technology.

The year's major technology trend — local-bus graphics — has helped make graphical user interfaces easier to deal with.

While 1993 saw the Video Electronics Standards Association's VL-local bus supersede proprietary approaches, users are curious to see how pervasive Peripheral Component Interconnect (PCI) will become, both in boxes and add-ins.

By this time next year, PCI should be ensconced as a new standard. Several other technology efforts may well follow suit, including the following:

- "Green" PCs; environmental designs will be a focus for 1994.
- Further integration of features onto the motherboard [CW Nov. 8].
- Pervasive use of CD-ROM drives in desktops.

How can computers ever
that does the comput

Chances are, you don't care about which microprocessor is inside your computer. And why should you?

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jet any better if the part
ıg is always the same?



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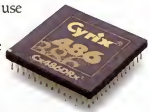
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Digital's Alpha battles steep incline

Windows NT, OSF/1 emphasis has not paid quick dividends

By Craig Stedman

One year into their rollout, Digital Equipment Corp.'s Alpha AXP systems are firmly implanted in VAX/VMS users' consciousness. Questions, however, remain about Digital's ability to market what analysts have called make-or-break technology outside the company's traditional customer base.

Alpha's success hinges on its DEC OSF/1 operating system now and Microsoft Corp.'s Windows NT on a longer-term basis. Both Alpha thrusts face significant roadblocks, such as a lack of multiprocessing support for the former and an ever-changing positioning of the latter. And while some longtime VAX customers are becoming more open to switching platforms, they tend to buy from other vendors with better Unix track records, such as Hewlett-Packard Co., IBM and Sun Microsystems, Inc.



Digital's Robert Palmer *is 'encouraged' by sales growth so far*

"Unless DEC really comes up with convincing evidence that Alpha will outperform HP or a high-end Sun server, there won't be any reason to go with Alpha," said Mike Thompson, information systems manager at Integrated Device Technology, Inc., a semiconductor vendor in Santa Clara, Calif.

Preparing for mix

J. R. Simplot Co., a food processor in Boise, Idaho, is "overwhelmingly" a VAX shop now and just bought a pair of low-end Alpha servers, said Raymond Sasso, its chief information officer. But he added that he is "certainly preparing for more of a mixed environment than we've had in the past."

Purchasing decisions will depend largely on application availability, Sasso and Thompson noted. "Whatever we can do on Alpha, we'll do," Sasso said. "But some of our software vendors will go in their own directions, and we'll have to accommodate them."

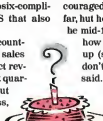
Roughly 3,000 applications are available for Alpha, including 1,500 for DEC OSF/1. The balance runs on Open VMS, a Posix-compliant derivative of VMS that also runs on Alpha.

Alpha machines accounted for 20% of system sales and 10% of total product revenue in the most recent quarter, amounting to about $150 million in business, according to Digital. These figures are in line with expectations, analysts said.

Technically, Digital has been getting good marks since it introduced the first Alpha systems last November. Alpha's price/performance remains strong compared with other RISC-based architectures, VAX code reportedly was ported to the new machines with relative ease, and the company for the most part is meeting or exceeding its plans for making layered software available, such as its clustering technologies and Rdb database, analysts said.

"Slow, steady progress is never very exciting, but they're consistently hitting doubles and triples," said Chris Christiansen, worldwide commercial systems research director at International Data Corp. (IDC) in Framingham, Mass., of Alpha's progress. "They never said they were going to hit home runs early on."

Most analysts said they do not expect heavy Alpha demand to materialize until the second half of 1994. Digital Chief Executive Officer Robert Palmer said he is "encouraged" by the sales growth so far, but he agreed that it will likely be mid-1994 before he can judge how quickly Alpha will ramp up (see chart). "Today I just don't have enough data," he said.



Some users, however, said the technology has evolved enough to make Alpha a viable choice for their next purchases. Most Alpha-based systems are finding homes as replacements for VAXs, analysts said.

Ralph Dunlap, senior manager of information resources for sales and manufacturing systems at Georgia-Pacific Corp. in Atlanta, said his company's strategy is oriented toward Alpha "at least as an interim solution for implementing NT" at the server level.

The Lutheran Church-Missouri Synod, in Kirkwood, Mo., plans to start migrating from VAX to Alpha running Open VMS next June when it needs more machines, said Steve DeLorey, director of applications and technical support.

Meanwhile, Digital is still tinkering with its derivative of Unix, OSF/1, to make it more attractive to users outside its base. OSF/1, however, still lacks key functionality such as multiprocessing, which is not scheduled for general availability until mid-July. "It's going to be another six months or so before Digital can legitimately pitch OSF/1 as a commercial product," said Terry Shannon, an independent consultant in Ashland, Mass.

Long way to go with Unix

Moreover, Digital is starting from almost ground zero in the commercial Unix market.

"When it's time for people to go buy a Unix server, they just don't think about Digital," said Lynn Berg, a program director at Gartner Group, Inc., a consulting firm in Stamford, Conn. "Having a bad image isn't as hard to overcome as not being on the radar screen."

Nor is NT necessarily the answer to Digital's Alpha prayers. It, too, brings more uncertainties. Digital is counting on NT support to lure PC vendors to support the Alpha chip set. However, it has been unable thus far to sign on any major PC manufacturers other than Ing. C. Olivetti & Co., in which Digital holds a minority investment.

One thing that could be making PC makers reticent is that Windows 4.0 will dominate the desktop for the next few years. Windows 4.0 — code-named Chicago — is 32 hit and due out for the Intel Corp. architecture in late 1994. NT is seen primarily as a lower-volume server operating system, analysts have said.

"Chicago is the next step on the desktop, and the big numbers are going in that direction," said Richard Zwetchkenhaum, a PC analyst at IDC. "NT is going to be pretty small potatoes with mainstream corporate customers."

Backing away from NT

Bud Enright, vice president of product marketing at Digital, acknowledged that there are "disconcerting aspects" to Microsoft's intentions regarding NT and Chicago. Digital has even backed off its ambitious NT plans while the operating system is put through the early paces [CW, Nov. 1]. "There are many unanswered questions, but I believe Windows NT will be a true juggernaut within two to three years," Enright said.

At a press briefing following Digital's annual meeting this month, Palmer said NT "is really for a very high-performance desktop at this point, so we don't expect any giant volumes in the near term."

There is hope that NT will become more of a factor "as memory prices come down" and make Microsoft's 16M-byte minimum recommended memory for the system less onerous, Palmer added. "I would prefer that it's quite successful . . . but I'm feeling under no real anxiety about it," he said.

Alpha, beta, gamma . . .

Digital's Alpha chip is expected to win a significant share of the 770,000-unit RISC market, which will grow to 4.6 million by 1995

	% of RISC market
1995	6.4%
1994	5.1%
1993	3.6%
1992	.66%

Source: Dataquest, Inc., San Jose, Calif.

Uncertain future

At Digital's recent annual meeting, CEO Robert Palmer said it is "hard to forecast" when the company will start growing its revenue again. "How fast VAX business might decline vs. how Alpha business might come up is unpredictable," he said. Palmer added that Digital is being hurt by its lack of a strong presence in indirect channels. "We need much more coverage out there to move off our existing base," he said.

Boosting volume

Signing up PC manufacturers is a move projected to help boost Digital's annual semiconductor volume from about 2 million devices to the 5 million that company executives say will be needed to fund operations at a new chip plant scheduled to start operation in Hudson, Mass., in 1996.

Setting priorities

Even though CEO Robert Palmer has made addressing Digital's well-publicized marketing and sales deficiencies a priority, the company is still losing orders "that should have been open-and-shut wins," according to Gartner Group analyst Wes Melling.

The company has been tinkering with its marketing operations in an attempt to set its house in order. Most recently, product marketing was broken away from Digital's engineering units and aligned more closely with its worldwide sales and marketing organization.

Bud Enright, who joined Digital in August as vice president of its Alpha AXP program office, is now in charge of all product marketing. Also getting an expanded role is Jesse Lipcon, formerly head of Digital's Windows NT program office. He is now vice president of systems marketing under Enright.

Enright acknowledged that Digital needs to build up its "marketing delivery mechanisms and processes." Despite a major sales force training program, though, he offered no promises of fast improvement. "It's not an on-off situation," he said. "It's going to be incremental improvement."

—Craig Stedman



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The Network Is The Computer™

Editorial

It tolls for thee

Why do CIOs continue to get fired as often as they do?

What many believed was a temporary aberration a few years ago, with 250% or more turnover in the CIO ranks, has continued unabated. Many of the mighty have fallen, and there is little reason to believe things will change soon.

Last month, an Andersen Consulting survey of 800 senior, non-IS executives discovered a group largely disenchanted with the returns on technology investments. In fact, eight out of 10 respondents ranked the returns minimal to average.

The cover story in the most recent issue of Forbes' *ASAP* magazine depicted lemming-like CIOs walking the plank into the abyss of unemployment, questioning whether it is "Ciao for CIOs?" Four years ago, a *Business Week* article posited whether CIO stood for "career is over." So the beat, or the beating as the case may be, has gone on for several years and does in fact continue.

Why? Certainly the contribution of IS is no less important to the corporation than it used to be. Our own independent, biennial survey of non-IS executives indicates that if anything, IS is growing in importance and is generally deemed extremely critical to the success of the organization.



I'll offer one reason for this state of affairs. Not enough CIOs are in Las Vegas this week attending Comdex. Too many of them have instead dispatched their chief technologists or PC managers to the desert. Why bother taking valuable time to shuffle through crowded exhibit aisles and even more crowded conference sessions when the displays and the discussions are mostly about PCs and LANs and multimedia?

Correct. That sort of stuff is much better left to others, like chief technologists, PC managers, outsourcing companies, your successor ...

There are still far too many people at top IS posts who believe their time is too valuable to spend on technology. It's something to be left to others while the CIO continues with the transition to full-time business strategist. All the while the error of their ways becomes apparent each week as one CIO after another is bounced.

Today's CIOs spent the first 20-plus years of their careers in the IBM 370 era. It was the only technology they knew, all they had to know.

Now the entire underlying technology structure is changing. Frankly, I feel some CIOs just don't want to bother with the learning process anew. And while the name of the game today is the same as it was 25 years ago — distributed computing — that same goal is reached in a far different manner in the client/server world of microprocessor-based computing than it was back in the mainframe-centric era.

So ask not for whom the bell tolls. It's clanging so darned loud these days for so many people that no one's getting much sleep.

Bill Laberis

Bill Laberis, *Editor in chief*



Letters to the editor

Got the faith

In reference to "Damage control" [CW, Nov. 1], I don't believe it!

Finally someone inside the trade press has the courage to say what's been the rumble on the streets for some time now: The Emperor is an naturel. Microsoft has nothing to fight with except fear, uncertainty and doubt. Windows 3.1 is a lame duck product, Windows NT is outsized and questionable, and who the heck knows if Chicago is another elegant shell on top of myopic old DOS or really a 32-bit operating system?

Thank you for writing and publishing your editorial. You have restored my badly damaged faith in PC journalism. More than that, you have made me really happy I've subscribed.

Joe Barr
Austin, Texas

Plenty of work for programmers

As the president of a company that specializes in recruiting computer professionals internationally, I must speak out and defend the reasons and legitimate uses for employing international computer programmers ["Remedy or ruin?" CW, Nov. 1].

First, let's look at some facts. The Bureau of Labor Statistics says positions for computer programmers will double by the year 2000 to about 1.2 million.

Unfortunately, according to the Department of Education, fewer students are majoring in computer science. In 1982, 8.8% of students were receiving technical degrees.

Last year, a University of California study found that less than 1% of students had any interest in computer programming. Where are American companies going to get the talent they need?

In addition, the number of foreign students enrolled in our universities is on the rise. The two most popular degrees for foreign students, according to the Education Department, are business and engineering.

What are American companies going to do to satisfy their need for computer science and computer engineering graduates? While there are some companies abusing the system, you should not condemn the practice altogether. There are many of us out there who play by the rules.

As far as putting thousands of programmers out of work, take a look at any major metropolitan newspaper on any Sunday. You will find hundreds of jobs advertised for computer programmers.

David Benson
President
Global Resources
Danville, Calif.

Customer size not an issue at IBM

I strongly disagree with Johanna Ambrosio's commentary, "Blue blues" [CW, Oct. 11], that suggests that IBM is ignoring its small to medium-size mainframe customers. Every customer is important to us — small, medium-size and large — and the experience of the overwhelming majority is dramatically different than what you described in your article.

That's not to say we're flawless, so we're making changes daily to be more responsive. Our marketing activity for small to medium-size customers is aggressive and focused. It includes the following:

- A direct sales force comprised of outbound marketing representatives who are committed to delivering same-day response.
- Product specialists who are expert in a wide range of technology.
- A direct-order capability.
- Alliances with nearly 20,000 business partners and software providers.

I would invite any of your readers who have a problem to contact our Information Support Center. It will ensure that the caller is contacted immediately and that any shortcomings are rectified.

R. J. LaBant
IBM
White Plains, N.Y.

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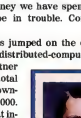
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Client/server may be ragged, but it's not on the ropes

Marc Dodge

Even a casual reading of the computer press and industry research shows that client/server computing is on the ropes. Say it isn't true! What about all the money we have spent? Yet, we must be in trouble. Consider the facts:

Everybody has jumped on the oh-my-god-isn't-the-cost-of-distributed-computing-awful bandwagon. Gartner Group says the total five-year cost of owning a PC is $40,000. (Don't worry, that includes the mouse pad.) Forrester Research says it costs up to $3,900 per year to support each LAN user. The Business Research Group says it costs $330 per year per LAN user in support staff salary alone.



Don't be misled by all the alarming statistics and revisionist cant. Client/server is still the way we'll all have to go.

My favorite alarming statistic comes from a company that computed the annual cost of LAN downtime for U.S. companies. The money lost was slightly less than the gross national product of Central America.

This research report has been quoted shamelessly over the last four years. (I refuse to name the company because I'm petrified it will publish an update, and we will have to live with it for the millennium.)

Another perceived problem with client/server is white collar productivity. Wags say LANs and PCs have not delivered. On the other hand, some people believe the reason job growth has not recovered with the economy is that LANs and PCs improved corporate communications. With improved communications, many middle managers hit the road.

The really hot story today is the mainframe. It turns out it isn't really dead after all. Starry-eyed print jockeys are climbing over each other to bow at the feet of the former pariah.

Why the resurrection? Because database technology has not evolved to support advanced forms of client/server computing. Applications requiring large data sets and geographically distributed data still need a data center.

There is more bad news. How can we implement and support New Age computing without a way to manage it? Imagine a database split among Los Angeles, Chicago and New York. How do we update data when Chicago goes down? How will we know when it goes down? Once we know, how do we fix it from Dallas?

These are all good reasons to move cautiously, but client/server will succeed because it is an exact fit with the core business.

Getting close to the customer

Client/server will succeed because we are scrambling to get closer to our customers. We are tailoring services to individual customers. Services we used to provide in a week are expected overnight. Soon, customers will expect them the same day.

Products and services have to be faster, better and more personal. My company has introduced more services in the last 10 years than in the previous 75 years.

The only way to meet customer expectations is to put decision-making authority closer to the customer. We can't do it with the old hierarchical management organization, and we can't do it with the old hierarchical computing architecture.

That is why client/server, LANs, PCs and downsizing have staying power. They match the needs of mainstream business.

Client/server ain't no oil painting, but it is here to stay. We may be stumbling, but we are all stumbling in the same direction.

Dodge is telecommunications department manager for a Fortune 100 company.

Say it, point to it or type it

Esther Dyson

How do you turn a potential success into an embarrassing flop? By promising more than you can deliver, as in the promotion of the Newton on the basis of its handwriting recognition skills.

The machine actually works fine for many tasks, but it was marketed most heavily on the basis of handwriting recognition, one of its weakest features. That's a little like selling DOS on the basis on its user interface. Basically, handwriting recognition is a poor way to enter free text, and it's not a great way to enter commands, either.

In fact, the natural successor to the keyboard for word entry is not the mouse or the pen but voice. Note that I said word entry, which means mostly single words or commands, not text entry, which will remain the province of keyboards for a long time.

It's not that voice recognition is that much more accurate or faster than handwriting recognition, but its "cost" in user effort is so much less. I don't really mind saying "load budget" three times, but I would mind writing it carefully one . . . two . . . three times to get it right.

Of course there are other factors involved, such as the presence of noise, that would work against the use of voice. On the other hand, if you are driving or knitting or clipping your nails, you might want to use voice. In general, the best approach is a combination. For example, I can use the pen to point at an object or word and voice to enter a command such as "erase," "send to Alice," "change to Friday" or "schedule Comdex meeting with Jim."

I can even use voice for light data entry, such as speaking a phone number or entering the product number for a customer's order of 29 red rubber ducks.

His shipping address and other information is already in the system, of course. It was entered the old-fashioned way, by keyboard, and can be downloaded to my Personal Digital Assistant or kept in my desktop computer, which I may someday control with voice too.



Handwriting recognition won't change the world, even when it's done right. Voice recognition and plain old keyboards will be just as important.

These technologies do not replace one another but rather add useful ways to interact with the system. Keyboard entry is to create the data; the pen (or mouse) is to select it or create graphical information; and voice is to enter brief commands.

A voice recognition system, like a handwriting recognition system, has a good chance of recognizing spoken instructions if it knows the context. Just as a human expects a name after "with" and a place after "at," a voice recognition system needs a set of possible commands for a certain application and information about whether you're likely to be specifying a name or a lunch location. Both a person and the system know the difference between Alice Haynes and Alice's Restaurant, given the context.

Thus, it's in the areas of understanding and context sensitivity, not phoneme or character recognition, that the biggest developments will come. They will make all kinds of recognition more effective.

What these developments won't do is make the keyboard outmoded (in fact, keyboard entry will be enhanced) or even significantly alter the roles that each technology plays in data capture.

Dyson is editor of "Release 1.0" and "Rel-East," newsletters on new technology and new computer markets in Eastern Europe.

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> PC/WEEK, 5/3/93

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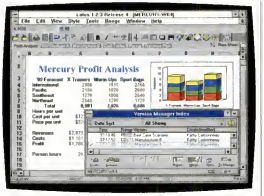
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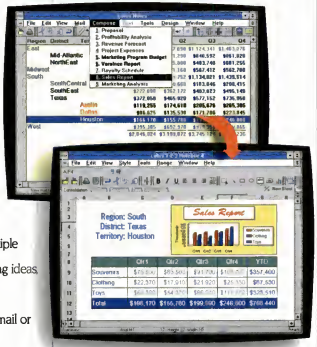
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WHAT OTHERS PROMISE TOMORROW,



Intel, Unisys Said to Plan to Develop Commercial Uses of Parallel Processing

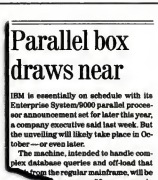
Intel Corp. and Unisys Corp. are teaming up in the race to develop a form of high-performance computing power known as parallel processing for the commercial market, industry officials said.

Intel and Unisys declined to comment.

Their development agreement, which is scheduled to be announced today in Santa Clara, Calif., is an attempt by Intel to move the building blocks currently

to bear fruit until 1990. And it will face stiff competition from others who have already entered the market or are planning to soon. Among larger companies, that includes Interconnect Business Machines Corp., which is planning to introduce parallel entry by year end.

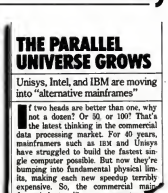
One parallel-computer always focused on the is Teradata, a Telephone & has done a



Parallel box draws near

IBM is essentially on schedule with its Enterprise System/9000 parallel processor announcement set for later this year, a company executive said last week. But the unveiling will likely take place in October—or even later.

The machine, intended to handle complex database queries and off-load that from the regular mainframe, will be any as 50 processors in ll. It will con-



THE PARALLEL UNIVERSE GROWS

Unisys, Intel, and IBM are moving into "alternative mainframes"

If two heads are better than one, why not a dozen? Or 50, or 100? That's the latest thinking in the commercial data processing market. For 40 years, mainframers such as IBM and Unisys have struggled to build the fastest single computer possible. But now they're bumping into fundamental physical limits, making each new speedup terribly expensive. So, the commercial mainframe industry, like supercomputer pioneers before it, is turning to parallel processing, ganging together cheap microprocessors to build computing

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Can PowerBook regain its cutting edge?

Apple must up battery life, fix other design flaws

By James Daly

The PowerBook has fallen to earth.

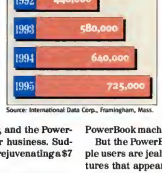
Two years after Apple Computer, Inc. dazzled the portable PC market with the slim elegance of the PowerBooks, the once ground-breaking machine now seems, well, ordinary.

When it was introduced at Comdex/Fall '91, the PowerBook boasted several technical and ergonomic innovations that made it an easy "Rookie of the Year." A trim design, a built-in wrist support and a trackball design drew critical raves, and sales went through the roof.

More than 400,000 of the portable computers were snapped up in their first year, and the PowerBooks became a billion-dollar business. Suddenly, a 5-pound portable was rejuvenating a $7 billion company.

Then something happened. Technologically, the PowerBook stood still. Meanwhile, other portable makers continued to innovate.

"The PowerBook is still a good machine, but there are certainly more advanced products on the market," said James Yip, manager of technical service at Ernst & Young in Toronto.



Source: International Data Corp., Framingham, Mass.

IBM's ThinkPad, for instance, sports the Trackpoint II, a handy little pointing device tucked into a nook among the G, H and B letters on the keyhoard. IBM clone makers such as NEC Corp. and AST Research, inc. are also integrating PCMCIA cards — tiny devices that contain hard drives, modems or memory. The PowerBook's slim design also now looks chunky alongside Hewlett-Packard Co.'s OmniBook 300, a 3-pounder that has a keyboard and display as large as those on a notebook computer.

"The PowerBook just doesn't stand out as much as it did in the beginning," said Eric Lewis, an analyst at international Data Corp. (IDC). "It's ordinary."

That does not mean PowerBook sales are off. in fact, IDC said sales will be up 32% this year, to 580,000. Appie iast week claimed to have shipped its millionth PowerBook machine.

But the PowerBook is no longer unique. Apple users are jealously eycing some of the features that appear on IBM PC portable clones, particularly PCMCIA cards.

"From a cross-piatform perspective, I'd iove to see [the PCMCIA card] with the PowerBook," said Rodney Schmidt, systems analyst at Eli Lilly and Co. in Indianapolis. "If Apple doesn't come out with them, I may need to think of going to other portalnes."


Apple's PowerBook *is no longer as unique as it was when introduced*

PowerBook rebates

Apple recently announced $100 to $500 rebates on select PowerBook portables. Purchase a PowerBook 165 or a 165C and receive $100 cash back; buy the PowerBook Duo 4/160 and receive $500 back. The rebate offer continues through January 1994.

Sources at Appie said their engineers are busy trying to add the PCMCIA feature to a PowerBook by next year. They are also upgrading the portabies from the passive-matrix screen technoiogy, which tends to suffer from ghosting. Appie recently added several models with crisp active-matrix displays and is expected to add a PowerBook that sports the speedy PowerPC 603 RISC chip next fall.

"These advances are key if Apple is going to remain in the pack of front-runners," said Pieter Hartsook, an Apple analyst in Alameda, Calif. The portable market is expected to begin another growth spurt soon, as mobile PCs are brought into areas such as sales and field service that have remained uncomputerized. Close to 5 million mobile PCs are projected to ship in 1995, according to Norwalk, Conn., research firm Inteco Corp.

If Apple wants to continue to gain from this windfall, PowerBook design flaws must he fixed, observers say. Battery life, for instance, remains a problem. While hrochures say you can get five or six hours from each charge, cxpect more like three. Users also say accessory doors break easily. Apple promises a fix.

Unless these and other deficiencies are repaired, the PowerBook may wind up just another technology that was fast out of the gate but quickly hecame winded.

"The PowerBook is just not on the cutting edge anymore," Hartsook said. "Whether Apple can get [the edge] back is anyone's guess."

Apple excess inventory spawns Macintosh auctions

By James Daly

Spring cleaning is coming months early at Appie Computer, Inc., which, facing criticism in the analyst community, has scheduled three large auctions in an effort to clear tens of millions of dollars worth of excess older inventory from its warehouses.

Appie plans to offer more than 18,000 discontinued Macintoshes and peripherals at the auctions, which are scheduled for Nov. 20 in Des Plaines, Ill.; Dec. 4 in Framingham, Mass.; and Dec. 11 in Washington.

"Appie is getting beaten up by the financial community because they are holding on to too much," said Eric Lewis, an analyst at International Data Corp. "Old PCs don't gain in value."

Among the items scheduled to go on the hlock are PowerBook Modeis 145, 160 and 170; Duo 210; Macintosh IISi; Appie IIG; assorted monitors; Macintosh Classic II; Quadra 700; CD-ROM drives; speakers; scanners; and printers. More than 6,000 machines and peripherals will be offered at each of the auction sites, which are located near Appie distribution centers.

Apple's software subsidiary, Claris Corp., will sell current application packages at previews the night before the Saturday auctions at their regular retail price.

Apple plans to auction more than 18,000 discontinued Macintoshes and peripherals, all of which will be covered by Apple's one-year warranty.

No current desktop models will be offered, and all of the products will be covered by Apple's one-year warranty, said Appie spokeswoman Jayme Curtis. "Everything offered has been returned new from the dealer channel," she said. "These are all buy-backs."

Buyers will be charged a 5% commission for each item sold.

Lewis said the auctions are not expected to impact Macintosh dealer sales. "Apple is going to sell an estimated 3.5 million PCs this year," he said. "This represents about two-tenths of 1% — it's a drop in the hucket."

SAS ports management system to Mac

By Gary H. Anthes
CARY, N.C.

SAS Institute, Inc. has successfuly ported the kernei of its system for information management, analysis and presentation to the Macintosh, and the company is now working on bringing up the graphical user interface.

SAS hopes to ship beta copies of SAS Mac hy April, when it will hoid its international user group meeting in Dallas. General availability is planned for a year from now.

Tom Cole, who heads the 12-person development effort, said the port is a challenge hecause of the size of SAS — more than 6 million lines of C code. However, he said all features in all 20 SAS products will be available on the Macintosh. "This will not be SASlite," he said.

However, Cole cautioned that SAS will be viable only on Macintoshes with Motorola, Inc. 68030 or faster processors and will require a hardware floating-point unit.

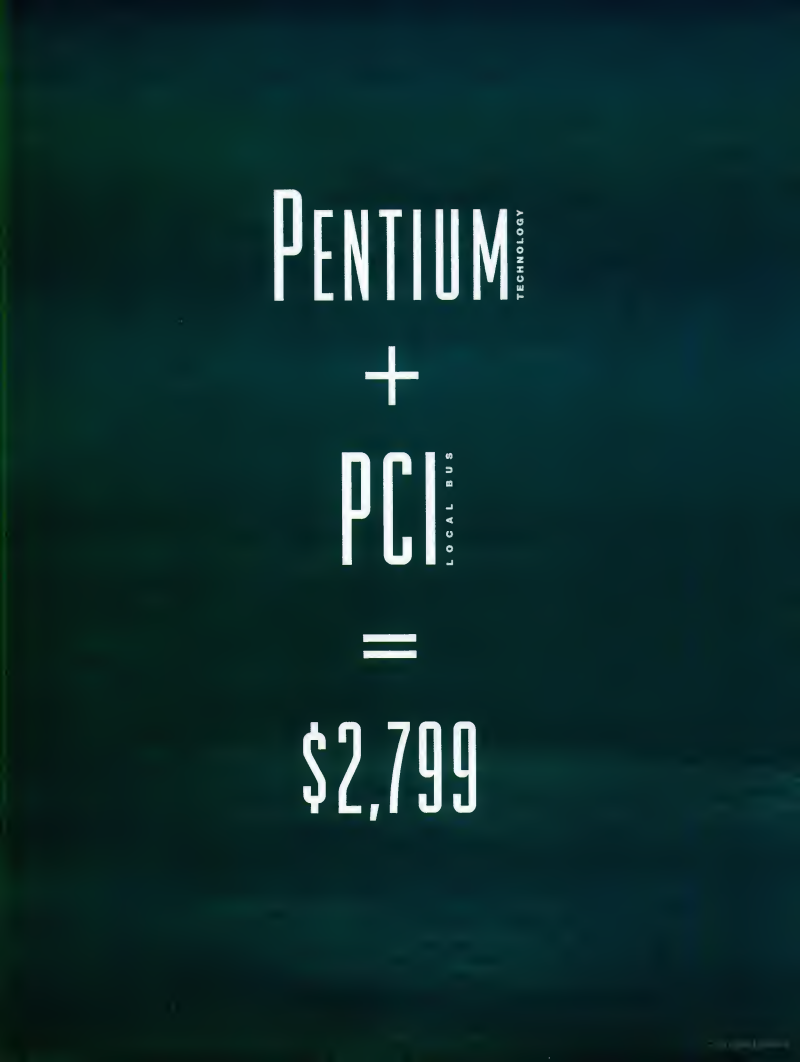
Cole, manager of VMS/Macintosh research and development, said SAS Mac will run on Macintosh servers or desktop machines in ways that allow spiitting of SAS processing across Appie Computer, Inc. networks or mixed networks containing MVS, Unix, OS/2 or Windows servers.

Predominant system

SAS is on Intei Corp.-based PCs at 98 Fortune 100 companies, Cole said. "But in upper management, they tend to have lots of Macs, and we'd like to deploy things like our [executive information system] technology on those desktops."

He declined to predict the demand for SAS Mac but said 10% of all PCs are Macintoshes. He said the company hopes to achieve penetration of the Macintosh market comparable to its reach into the iBM PC market. SAS now runs on Intel-based PCs at 12,000 sites, a SAS spokesman said.

SAS, *page 65*


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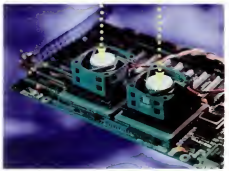
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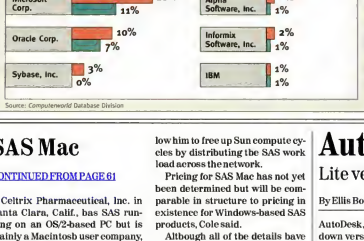
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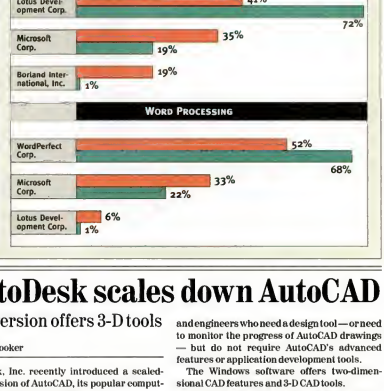
MARKET VS. TECHNOLOGY MISMATCH

User views of which vendors offer the best technology don't necessarily match their perception of the market leaders

Q. Which vendor do you feel is the technological leader and which do you feel is the market share leader in each category?

KEY:
TECHNOLOGY
MARKET SHARE
BASED ON 134 RESPONDENTS





Source: *Computerworld* Database Division

SAS Mac

CONTINUED FROM PAGE 61

Celtrix Pharmaceutical, Inc. in Santa Clara, Calif., has SAS running on an OS/2-based PC but is mainly a Macintosh user company, said Mark Holdbrook, manager of clinical data processing.

Holdbrook said he might set up the Sun box as a SAS server and let his users access the database using their Macintoshes as X Window System terminals, or he might put SAS on the Macintoshes when the software is available. He said the latter approach would allow him to free up Sun compute cycles by distributing the SAS work load across the network.

Pricing for SAS Mac has not yet been determined but will be comparable in structure to pricing in existence for Windows-based SAS products, Cole said.

Although all of the details have not yet been worked out with Apple, Cole said SAS plans to support the new RISC PowerPC-based Macintosh when it makes the Motorola-based version of SAS available.

He said SAS will run in native mode on the PowerPC, not in emulation mode, as will be necessary for some Macintosh applications.

AutoDesk scales down AutoCAD

Lite version offers 3-D tools

By Ellis Booker

AutoDesk, Inc. recently introduced a scaled-down version of AutoCAD, its popular computer-aided design (CAD) software.

AutoCAD LT carries a recommended price of $495. The software uses the same .DWG file format as the industrial-strength AutoCAD system, for which there are more than 900,000 users worldwide, according to AutoDesk. That high-end package, which runs on many hardware and operating system platforms, sells for $3,750.

AutoCAD LT is aimed at architects, designers and engineers who need a design tool — or need to monitor the progress of AutoCAD drawings — but do not require AutoCAD's advanced features or application development tools.

The Windows software offers two-dimensional CAD features and 3-D CAD tools.

AutoCAD LT requires at least an Intel Corp. 80386 chip, MS-DOS 3.31, Windows 3.1, 4M bytes of RAM and 10M bytes of available hard disk space. The program also supports Windows' Object Linking and Embedding feature.

Separately last month, AutoDesk introduced Release 2.0 of AutoSketch, its Windows-based tool for precision 2-D drawing. The latest release, which will also be available in the fourth quarter, will be priced at $299.

Remote access

Stampede, Ocean Isle ready notebook software

By Michael Fitzgerald

Seeking to ride the surging notebook market, two remote access software makers recently made moves.

Stampede Technologies, Inc. in Dayton, Ohio, recently began shipping its Remote Office package, while Ocean Isle Software in Vero Beach, Fla., went into beta testing on a full Windows version of its Reach Out Remote Control and Total Remote software, said Doug Fowler, vice president of new product development.

Pricing on its Remote Office ranges from $395 for a two-user version to $9,499 for a 32-node version with an Ethernet adapter and DigiBoard communications hardware. Ocean Isle's software will be priced on release, but the stand-alone-oriented package will probably cost less than $200 at introduction, Fowler said it will support TCP/IP, run 25% faster than the current version and let users remotely access multiple applications.

Notebooks represent the fastest-growing part of the PC market, and users welcome the chance to have more remote access products.

"I'm certainly interested in something a little more user-friendly," said Randall Huber, director of information services at Audience Research & Development in Dallas. Huber said he is happy with the features and functionality of his remote access software, Symantec Corp.'s PC Anywhere, but thinks it is difficult to use.

Options galore

Analysts said the notebook market should create more choices in remote access software.

"These sorts of products will only become more important as things like the [Casio/Tandy Corp.] Zoomer proliferate," added Gerry Purdy, analyst at Pacific Group in Cupertino, Calif.

In the future, utilities that provide remote access capability may go away. Jeffrey Henning, an analyst at BIS Strategic Decisions in Norwell, Mass., said that while "remote access software is a key utility right now, eventually it'll get built right into the operating system."

Software AG tool eases load balancing

By Gary H. Anthes

Software AG of North America, Inc. announced Entire Reporting Workstation, a tool for Windows-based PCs that enables users to access, display and manipulate data for reporting and presentation in graphical or text formats.

Entire Reporting Workstation allows users to access enterprise data and bring it to their PCs for further processing and analysis. It works with Software AG's mainframe-based Super Natural reporting tool and its Entire Connection for Windows, a file transfer and electronic-mail product.

Without Entire Reporting Workstation, a PC user would simply get an IBM 3270-like finished report downloaded from the mainframe, generated by a character-based query tool that is harder to use, said Tony Cook, director of workstation marketing at Software AG.

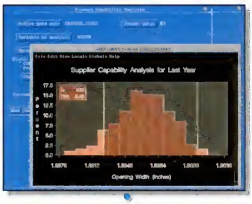
By moving some processing from the mainframe server to the desktop, the product reduces network traffic and makes load balancing easier, Software AG said. It offers the consistency and security of a server-based system with the ease of use of a Windows application, the company said.

Reports can be exported to other Windows applications such as Microsoft Corp.'s Excel or Word, and files can be imported into the product from other applications. The product is intended for end users such as financial or market analysts, Cook said.

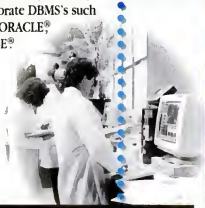
The product is sold in the U.S. by Professional Sales Solutions, Inc. in Warrendale, Pa. Single copies are available for $300.

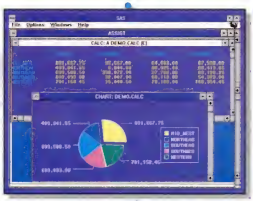
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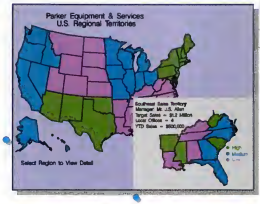
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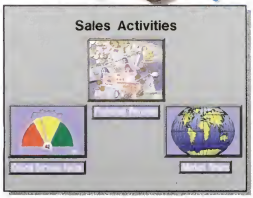
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HELP LINE



Part of an occasional series of columns aimed at providing users with answers to technical questions about their software. This week's questions and answers are provided by software services provider Corporate Software, Inc. in Canton, Mass.

Microsoft Corp.'s Excel for Windows Version 4.0:

Q. Is it possible to have a macro automatically execute when I open a file in Excel?
A. Yes, macros can be executed automatically when a file is opened. To do this, select Formula/Define Name and then enter Auto Open in the Name field. In the Refers To field, enter the address of the first cell in the macro with the file name included (for example, C:/EXCEL/MACRO 1.XLM! $AA1). Then save the file. When you open the file, Excel executes the macro referred to in the Auto Open range name.

Q. How can I extract records from a database located on another worksheet?
A. You can extract records from a database located on another worksheet or macro sheet if you specify an external reference formula for the name Database in the Define Name dialog box. This is useful when you're working with a very large database. The criteria range and the extract range must reside on the same worksheet. An example of an external reference formula for the range name Database might be (=DATA.XLS !$A$1:$G$100). The only range name that has an external reference is Database; Criteria and Extract are on the active or current worksheet.

Q. After I type a number into a cell, I want to be able to press Enter and have the cursor remain in the same cell. Is this possible?
A. Yes. Select Options/Workspace and deselect Move After Enter. When you press Enter, the cursor will now remain in the same cell.

Microsoft's Excel for the Macintosh Version 4.0:

Q. Can I have the macros from my macro sheet available without having to actually open the macro file?
A. Yes. Move the file containing the macros into the Excel Startup Folder, which is located in the System Folder. When Excel is started, choose Macro/Run, and the macros in the macro sheet will be available.

Lotus Development Corp.'s 1-2-3 for Windows Version 1.x:

Q. How can I print the actual formulas that I have entered in a spreadsheet?
A. To print out the formulas of a spreadsheet, select the range you want to print. Then select Range/Format and choose the Text option. The formulas will be displayed on the spreadsheet, and you can now print them. To set the spreadsheet back to normal, reselect the range, then choose Format and General from the Range menu.

Microsoft's Windows Version 3.1:

Q. Is there anything I should consider when installing Microsoft's Windows on a machine running QEMM-386?
A. To install Windows on a machine where QEMM-386 is installed, leave the QEMM-386 drivers installed and active on your machine. The Windows Setup program detects QEMM-386 and installs Windows in a way that maintains complete compatibility.

After Windows is installed, run the QWINFIX program in the QEMM directory, which adds the entry SYSTEMROMBREAKPOINT=FALSE to the [386enh] section of the SYSTEM.INI file so that Windows can support the QEMM-386 stealth feature. Run the Optimize program in the QEMM directory to ensure that the system is still configured properly after Windows adds or updates drivers in CONFIG.SYS or AUTOEXEC.BAT.

Q. What is the meaning of the "general protection fault" error message?
A. A general protection fault occurs only in the standard and enhanced modes of Windows. This error message indicates that something unexpected has happened within the Windows environment — usually an improper memory access. In other words, a program running in the Windows environment has made a call to a location in memory that it cannot access, thus overwriting and corrupting the program code that already resides in that area of memory.

Since all memory management in Windows is supposed to be handled by the Windows environment itself, when applications or Windows components directly access memory, the result is often a general protection fault.

Q. What is the meaning of the "system integrity violation" error message?
A. A system integrity violation is a message that indicates a general protection violation by an MS-DOS-based application. Similar to the general protection fault, the system integrity violation indicates that the DOS application is accessing memory that does not belong to it.

Since Windows is managing memory in this situation, the DOS application's memory access will corrupt Windows program code or vital data. Windows generates an application execution error and terminates the application. This message can also occur when an MS-DOS application tries to access a system's hardware component directly.

Lotus' Freelance Graphics for Windows Version 2.0:

Q. How can I change the default fonts for a presentation in Freelance Graphics?
A. Select a font from the Default Attribute option under the Style menu. This selection will change the default font for the current presentation. To change the default font for new presentations, edit the slide master's default font by opening the slide master and selecting a new default font.

Novell, Inc.'s NetWare Version 4.0:

Q. How can I change the server license on a Novell NetWare 4.0 server?
A. To change the server license on a Novell NetWare 4.0 server, enter LOAD INSTALL-M at the server prompt.

Intel/AMD clash generates user benefits

By Michael Fitzgerald
SANTA CLARA, CALIF.

Sometimes a computer industry splitting match can bring good things to users, as evidenced by Intel Corp. and Advanced Micro Devices, Inc.

Intel's battle with AMD on the processor side has led to lower system prices for users. PCMCIA is the current target for Intel and AMD's challenge match. The two recently bumped the PCMCIA market forward, Intel with new PC cards and flash memory chips that hold more information and AMD with a lower-voltage flash chip that will suck less power from portable computer batteries.

Intel added 16M- and 32M-bit flash parts to its line, incorporating a new technique called dual-die packaging to build the 32M-bit flash memory chip in the same size package as its lower-capacity brethren. It also introduced flash cards that hold up to 40M bytes of data and enhanced its cards to support up to 1 million read/write cycles. Pairing up with Conner Peripherals, Inc., Intel introduced AT-bus Attachment cards with 5M and 10M bytes of capacity.

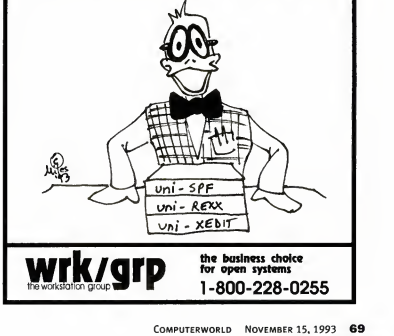
The 16M-bit parts are available now, while the 32M-bit parts, the new cards and the new drives are scheduled to become available late in the fourth quarter or in the first quarter of 1994. Steep pricing for user-oriented products continues, however, with a 4M-byte card costing $290 in units of a thousand, a 20M-byte card costing $925 and a 40M-byte card $1,895. The 5M- and 10M-byte drives cost $310 and $475, respectively.

Meanwhile, AMD took the low end, bringing out a 4M-bit flash part that runs at 5V. The 4M-bit flash components market is expected to be a high-volume arena this year, and the low-volt aspect could mean good things for users shocked by the power drain caused by PC cards. While Intel's new parts are capable of running in 5V or 3.3V systems, they are 12V parts.

In a related announcement, Microsoft Corp. said SystemSoft Corp. in Natick, Mass., will distribute the Microsoft Flash File system and take over development of Flash File. Flash File, which controls the way the operating system reads PCMCIA cards, will become part of SystemSoft's CardSoft PCMCIA support software.

Intel is interested in flash partly because it presents the company with an opportunity to get back into the memory market, a market it created but later ceded to the Japanese. Gordon Moore, Intel's chairman, said flash "has an excellent chance of being bigger than DRAM."

While the most visible market for flash is in PCMCIA memory cards, peripherals and drives, the largest volume comes from components in conventional hard disk drives, modems, digital cellular telephones and PCs.



Virtual reality, real money

Japan's Matsushita hopes virtual reality support system will double sales

By David Kellar

Virtual reality is ready to take a step into the commercial home electronics market. Next spring, Matsushita Electric Works Ltd. in Osaka, Japan, will deploy virtual reality decision-support systems at its product showrooms throughout Japan to help homeowners visualize their new kitchens before ordering.

Newly developed home fitness and relaxation products that promise to provide consumers with a mind-soothing place to escape from the hustle and bustle of the workaday world are also set for release early next year.

With the kitchen system, Matsushita — a sister firm of electrical giant Matsushita Electric Industrial Co. and one recognized by analysts in Japan as a pioneer in virtual reality — hopes to assure a buyer that the planned arrangement of cabinets, counters and appliances really works as the buyer imagines. The needed confidence is provided by a virtual space decision-support system called Viva (Virtual Reality for Vivid A&I space system), which takes customers into a virtual kitchen generated from their plans. Matsushita offers more than 30,000 kitchen products, presenting an infinite number of layout possibilities.

Advanced technology

"The ability to 'feel' the room gives the customer confidence that the design is right and helps catch potential problems before the kitchen is built," explained Junji Nomura, senior staff researcher directing virtual reality systems development at Matsushita's virtual reality research and development group.

Increased customer confidence translates into increased sales: On average, 80% of those who use the virtual reality simulation system place kitchen orders, Nomura claims. For those who do not use virtual reality, the figure is 35%.

Touted as "the first commercial application of virtual reality in the world," Viva lets potential system kitchen buyers walk around, open cabinets, check the counter height, turn on faucets and view the room from different angles in three-dimensional space. A Silicon Graphics, Inc. (SGI) workstation generates 3-D graphics in real time according to movement commands sent from a data glove and an "eyephone" goggle/headset that immerses the user in images and sound.



Viva *leads customers into a virtual kitchen from their own plans*

Though currently shackled by expensive computer hardware, mediocre image quality and a heavy, unwieldy headset, the Viva system — which has been in trial use at Matsushita's Tokyo showroom since 1991 — will soon undergo a major technological evolvement that Nomura claims will solve these problems and pave the way for deployment of the system in showrooms throughout Japan.

"We've spent the last three years developing and improving the system, identifying problems and making sure that we can actually reproduce virtual models of the kitchens' that our customers design," Nomura said.



A Silicon Graphics, Inc. *workstation generates graphics that immerse the user in images*

Bringing down costs

To achieve the price/performance necessary for full-fledged deployment, Matsushita engineers are harnessing Intel Corp. Pentium power to develop a low-cost version of the Viva system. When it is complete, Nomura said he expects to achieve a per-system cost of about $90,000 — approximately one-tenth the cost of the SGI-based prototype.

On the software side, the company is switching from VPL Research, Inc.'s Reality Built for 2 platform to Sense Eight's PC-based World Tool Kit. Programmers are working overtime to write World Tool Kit-based versions of the Viva programs — nearly 80% are applications originally developed by Matsushita.

Since even a graphics-tuned Pentium is slower — 30% slower, according to Nomura — than the SGI/VPL system, techniques such as texture mapping will be incorporated in the new system to reduce the polygon processing load. Texture mapping will also provide the extra benefit of adding patterns for more realistic images.

The heavy (2 kilogram) and expensive ($35,000) VPL Eyephone used will be replaced by the lightweight (350 grams) and inexpensive ($2,000) goggles Matsushita developed for its consumer-use virtual reality products (see box below). Although the image resolution of the new goggles will initially be the same as the current system — about 100,000 pixels — Nomura said he expects near-term advances in LCD technology to enable improvement to television-quality 250,000-pixel resolution by the end of 1994 and to high-definition, 1 million-pixel resolution in the next few years.

Nomura said Matsushita's most difficult technical challenge in developing Viva into a commercially viable virtual reality system was streamlining the data input and management process.

Entering the vast amount of graphics data necessary for the virtual reality image database is by far the most time-consuming factor in creating a virtual reality application. When the University of North Carolina, which is active in virtual reality research, prepares its virtual reality demonstrations, for example, data input can sometimes take several months, Nomura said.

"That's OK for a demonstration, but when using a virtual reality system for business purposes, it's just not practical," he said.

For Matsushita's Viva system, the data input process involves converting 2-D computer-aided design drawings of kitchen components into the 3-D image data required by the virtual reality system, then linking the objects together into a contiguous whole.

Kellar is Tokyo correspondent at the IDG News Service.

Cycle into cyberspace

While virtual reality has proved to be a boost to Matsushita Electric Works' bottom line as a sales support tool, its real potential profitability lies in applications that can be mass-produced and sold to the consuming public, according to Matsushita officials.

Matsushita will make its first foray into this promising area next spring with the release of two products that apply virtual reality to the aid of fitness and health.

The "Relax-Refresh Lounger" is a massaging chair that uses virtual reality images and sound to help relax the user. It monitors the user's pulse rate and automatically controls the images and sound to match the user's body condition and state of consciousness for maximum effect. The 3-D image software sold on videocassette tape is played on a conventional VCR connected to the system.

The "Cycling Machine" is an exercise bike that lets the user cycle through a 3-D virtual world while exercising. Inside the computer-generated world, the rider must avoid obstacles such as buildings and cars. Bike speed changes according to the pedaling speed, and pedal resistance varies according to the surface of the road.

—David Kellar



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New Products

Keyfile Corp. has introduced Keyfile Version 2.2, integrated document management software.

According to the Nashua, N.H., company, the product enables organizations to distribute Keyfile document servers to users anywhere across their enterprise networks.

Version 2.2 supports TCP/IP and Banyan Systems, Inc.'s Vines network protocols, and the product features true WYSIWYG TypeMatic comments, improved Tag Image File Format, Internet electronic mail and an enhanced briefcase capability.

The Keyfile workgroup edition costs $2,995. The keyfile enterprise edition, consisting of the client and server, is priced at $995 and $4,995, respectively.

▶ *Keyfile*
(603) 883-3800

Systems Compatibility Corp. has introduced Soft Bridge 6.0, a file-conversion program for PCs that supports more than 100 DOS, Windows and Macintosh file formats.

According to the Chicago company, Version 6.0 can convert 13 new files, including WordPerfect Corp.'s WordPerfect 6.0 for DOS and Windows, Word 6.0 for DOS and all versions of Lotus Development Corp.'s Ami Pro.

The product converts files into a user-selected word processing format from more than 100 word processing, database and spreadsheet programs.

Soft Bridge 6.0 costs $99.

▶ *Systems Compatibility*
(312) 329-0700

Central Point Software, Inc. has announced PC Tools Pro 9.0 for DOS, which includes CPR, a work-recovery utility capable of restoring unsaved work-in-progress after a system crash or power failure occurs.

According to the Beaverton, Ore., company, PC Tools Pro 9.0 for DOS features support for DoubleSpace and Stacker drives and large disks up to 2G bytes, critical-error messaging for LAN administrators, integrated hardware diagnostics and expanded protection against unknown viruses.

The product costs $179.95.

▶ *Central Point Software*
(503) 690-8088

Stylus Innovation, Inc. has announced Visual Voice, a Visual Basic custom control and graphical workbench.

According to the Cambridge, Mass., company, the product allows developers to build sophisticated, PC-based voice-processing applications.

Users can create applications such as Touch-Tone order entry, voice mail and fax-on-demand. The product offers functions such as waiting for inbound calls and detecting ringing connection; line dropping; playing and recording voice files; making outbound calls; and detecting busy signals.

Visual Voice offers an introductory price of $495.

▶ *Stylus Innovation*
(617) 621-9545

The Molloy Group, Inc. has introduced Top of Mind Help Desk for Windows, a software system based on cognitive processing.

According to the Parsippany, N.J., company, the software provides users with accurate, up-to-date answers to problems, while gathering and storing precise data about user needs.

Instead of working with existing "expert" systems, Top of Mind employs a self-learning cognitive processing system that gives users automatic access to problem resolutions.

A single-user workstation is priced at $4,500. A 15-user LAN version costs $22,500.

▶ *The Molloy Group*
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For more information or the name of your local reseller, call (800) 426-9400. And let new Windows for Workgroups 3.11 get your PC up to speed.

Microsoft Windows for Workgroups

Microsoft

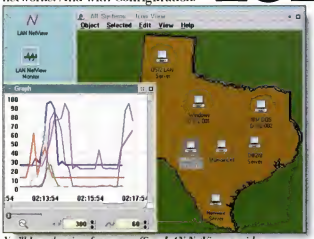
The disk I/O performance gains represented were measured with Disk WinMark™ performance tests using WinBench™ version 3.11 from Ziff-Davis Labs. Two test configurations were used and the performance results averaged to produce a single percentage: Northgate® Slimline 320 with Intel® 80386/20 CPU, 4MB RAM, 2048KB RAM Cache, 200MB hard disk, IDE controller, and no hardware disk cache; Zenith® Zenote 425L with Intel 80486/25 CPU, 4MB RAM, 512KB RAM Cache (SmartDrive 5.0 with Windows 3.1, 32-bit file access with Windows for Workgroups 3.11), 200MB hard disk, IDE controller and no hardware disk cache. Tests were run using shipping versions of Windows 3.1, Windows for Workgroups 3.11 and MS-DOS® 6.2. Tests run independently verified by Ziff Communications Company. Zenith is a registered trademark of Zenith Electronics Corporation. Intel is a registered trademark of Intel Corporation. WinMark and WinBench are trademarks of Ziff-Davis. Northgate is a registered trademark of Northgate Computer Systems, Inc.

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Windows for Workgroups faces off with Novell

By Ed Scannell

Trying to make the market forget about the first version of Windows for Workgroups, Microsoft Corp. last week formally rolled out a more robust successor that will face direct competition from Novell, Inc.

Unlike the first version, Windows for Workgroups Version 3.11 appears to have an enthusiastic backing from some Top 10 hardware manufacturers, which plan to bundle it with both server and desktop systems.

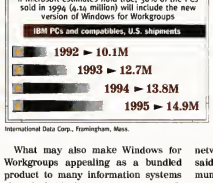
With that kind of support, Microsoft believes it can far exceed the 1 million copies it sold of the first version. In fact, Microsoft officials have said in internal communications that they expect Version 3.11 will ship with 30% of all PCs during the next year.

Besides grabbing a healthy piece of the peer-to-peer networking market, Microsoft wants Version 3.11 to give users a taste of what the 32-bit Windows 4.0, code-named Chicago, will be like.

One of the technical highlights of Version 3.11 is its 32-bit file system, which is being drawn from Chicago. That file system, along with other improvements, makes Version 3.11 up to 100% faster in many applications than the current Windows 3.1.

All of the program's networking components, including its redirector and NetBEUI transport for supporting Novell, Inc.'s NetWare, are also 32 bit.

"I am recommending it for a lot of our users because our company is transitioning up to networks over the course of 1994, and this [Windows for Workgroups] makes it a lot easier," said Tom Gibson, PC coordinator at Weyerhaeuser, Inc. in Portland, Ore.



International Data Corp., Framingham, Mass.

What may also make Windows for Workgroups appealing as a bundled product to many information systems shops is that it gives users access to a 32-bit file system without requiring them to be on a network. This will give IS managers the option of installing Windows for Workgroups as a stand-alone program.

"MIS is scared to death of Windows for Workgroups. They don't want all these networks scattered about," said Kimball Brown, an analyst at Computer Intelligence/InfoCorp in Santa Clara, Calif.

While Microsoft has an advantage with the hundreds of OEM bundling agreements in place for DOS and Windows 3.1, some observers said they believe Novell could make things interesting in some corners of the corporate market.

Expected to ship in the next month, Novell's DOS 7.0 combines an improved version of DR DOS 6.0 with Personal NetWare.

DOS 7.0 features

Unlike DOS 6.2, the Novell product can multitask many applications in character mode in the background. Its other advantage, according to analysts, is that IS managers also have the option of turning one of the peer systems in to a server on the network.

"You can take a peer and load it up with files that anyone [on the network] can access just like a server," said Frank Dzubeck, president of Communications Network Architects, Inc., a consultancy in Washington. "And priced at $69, it is not a bad deal. Of course, they are not going to be able to compete against Microsoft with OEM deals."

However, one DOS 7.0 feature that Novell is touting as a major advantage could turn out to be a stumbling block.

Version 7.0 contains a new DOS Protected Mode Services (DPMS) programming interface that helps alleviate the perpetual memory-crunch problem that DOS presents. However, the new 16-bit model may not be fully compatible with Microsoft's 32-bit virtual device drivers in Windows for Workgroups.

"Their DPMS model is interesting, but the question is, are they inventing a whole new standard for device drivers where people have to go back and rewrite their device drivers?" asked Rogers Weed, product marketing manager for Windows for Workgroups.

Aside from not being 32 bit, Novell DOS 7.0's DPMS programming interface should not cause users any compatibility problems with Windows for Workgroups, Novell officials said.

"The NetWare clients can take advantage of their virtual device drivers, and our server doesn't need to use them, so there should be no incompatibilities," said John Linney, line product manager for DOS 7.

Despite the odds, Novell may be able to effectively leverage DOS 7.0's network orientation against Microsoft in larger accounts where NetWare plays a strategic role in the enterprise.

"With just print and file [server capabilities]— never mind the sexier stuff— I think they can make this a winner," Dzubeck said.

Start-up readies Windows BBS

By Micbael Vizard

A small start-up last week launched Channels, an interactive bulletin board system for Windows said to provide — at a substantially lower cost — many of the popular features found in Lotus Development Corp.'s Notes groupware package.

Team Software, Inc. in Houston built Channels around a database engine from Raima Corp. that allows multiple users to log in to a discussion in real time. Users can then post a comment, add a document via electronic mail or chat on-line with other users.

Through December, Channels costs $395 for a 10-user starter pack. In January, the price will increase by $200. Notes is priced at $495 per user.

Channels "kind of" combines the functions of a chat utility with the discussion database associated with Notes, said Bob Flanagan, an industry analyst at WorkGroup Technologies, Inc. in Hampton, N.H.

He predicted that Channels will probably make a solid low-cost alternative for customers who only need an interactive discussion database. In contrast, the discussion database in Notes is augmented with a set of application development tools that will allow sites to build a richer set of office automation applications.

Windows BBS, *page 77*

Bank treasures Unix system

Plans to promote the use of open systems servers

By Jean S. Bozman

Until recently, Sanwa Bank California was a traditional mainframe operation that did not want to be on the leading edge of technology. But a Unix-based packaged system in its treasury department and the start-up of a custom Unix system in June have shown information systems managers the promise of a new tier of midrange servers between PCs and data center mainframes.

In one stroke, the Unix-based treasury system, first installed 18 months ago, has reduced the IS department's application backlog and made data more accessible to financial traders. But it also has bad unintended benefits, such as a greater sense of independence and control for its end users.

The packaged InTrader system from Digital Solutions, Inc. in Bloomington, Minn., (recently acquired by Sungard Financial Systems, Inc.) runs on four Hewlett-Packard Co. Series 700 Unix workstations, about 35 X Window System terminals and a Progress Corp. relational database. The same Unix workstation network hosts a 5-month-old custom-built wholesale currency system, which is based on the Oracle Corp. database.

In control

About 15 of the bank's traders use the InTrader application, while five traders use the homegrown currency system.

"We're a self-supporting unit now," said John Precopio, an assistant vice president at the bank's treasury division and the treasury system's coordinator. "We're learning about the network, how to support Unix, writing programs and supporting programs," he said. "The old system was run by a service bureau, and we had to go by their rules. We're in control now, and we have more access to our own data."

Traders are more involved with data, keying in transactions on bonds, treasury bills and Eurodollars rather than writing them down on slips of paper for others to input. "The traders are on the front end, entering transactions," Precopio

Bank, *page 80*

ON SITE

Sanwa Bank California
Los Angeles

Challenge: To begin operation of a Unix-based treasury system that invests millions of dollars for top corporate customers, yet maintain links to the data center.

Strategy: To buy packaged software, relational databases and the Unix system and to leverage investments by updating mainframe databases.

Results: Users are able to manipulate data and create custom reports.

Work flow

Document management system firms prep upgrades

By Michael Vizard

Leading PC document management systems vendors are set to escalate their battle for market share with major upgrades of their products over the next two months.

The enhancements will focus primarily on adding the ability for multiple authors to work on the same document simultaneously by including support for synchronized replication and integration with Notes.

"As we move into workgroup computing, these kinds of abilities will be critical. A large percentage of documents are now created by multiple people," said Carl Frappaolo, a vice president at the Delphi Consulting Group in Boston.

Leader of the pack

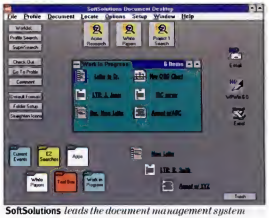
Leading the way is SoftSolutions Technology Corp. in Orem, Utah, which last week was acquired by WordPerfect Corp. Last week, SoftSolutions announced that next month it will ship Version 4.0 of its namesake document management software. Version 4.0 will include support for Notes, work-flow software from Reach Software, Inc. and partial support for Version 2.0 of the Object Linking and Embedding (OLE) interface. Also included will be support for a customizable interface, replication of document libraries to remote sites and support for SQL.

PC Docs, Inc. in Tallahassee, Fla., meanwhile, will announce at Comdex/Fall '93 that its next release will support Notes and replication. And next month, Saros Corp. in Bellevue, Wash., will ship its first commercial document management system on top of its Mezzanine object database, which allows its document management system to support multiple data types and OLE 2.0.

"Document management systems are really good at managing the active work flow of creating documents across teams and boundaries. Once completed, we want to use Notes as a knowledge base for those documents," said Sally Gonzalez, manager of firmwide prosective systems at Jones, Day, Reavis and Pogue, a law firm in Cleveland.

SoftSolutions is identified as the market leader, with a 59% share of the document management system market, followed by PC Docs with a 21% share and Saros with a 7% share, according to International Data Corp.

But some SoftSolutions users said the company's rapid growth is exceeding its ability to support its software. "They are going through a lot of growing pains and are having a difficult time managing their programming life cycle," said Gary Faulk, a PC application specialist at Nixon, Hargrave, Devans and Doyle, a law firm in Rochester, N.Y.



SoftSolutions *leads the document management system market, but some say growth has affected its support*

Against upgrades

According to Faulk, who manages more than 600 PCs running word processing software from WordPerfect, PC databases and the SoftSolutions document management system, the company has been telling him to upgrade to a new version rather than fix existing software.

"For us, an upgrade means new training and support costs to install it. And when the new release comes out, it will have problems, so it becomes an endless loop. I think they should focus on fixing the existing software," Faulk said.

During the past year, SoftSolutions has delivered two bug fixes, a point upgrade and now a major release, he noted. But Faulk said his firm is not likely to switch vendors because of the massive investment in the SoftSolutions system.

IT'S BUILT ON A FOUNDATION OF OVER 1,000,000

CAN'T

Windows BBS

CONTINUED FROM PAGE 75

For example, Elf Acquitane, the French national oil company, is running 10 Channels databases on a PC server in its Geneva offices. Using TCP/IP, up to 80 traders in Houston, Paris, Madrid, Singapore, London and Santiago, Chile, use the system to exchange documents and have on-line conversations.

"We needed to be able to share information on a real-time basis, and we didn't need all the capability of a Lotus Notes. We simply wanted to keep people informed. With Channels, all you have to do is write a macro and your document is sent to the database via electronic mail," said Xavier Sanzy Prast, information systems manager for international supply, trading and shipping.

Team Software President Sean Doherty said his company plans to focus on providing workgroup applications for the Windows market only and that it has no plans to build an application development environment around its products.

At the same time, Doherty said he did not know what effect Microsoft Corp.'s forthcoming Electronic Mail Server for Windows NT, which is expected to include support for a built-in bulletin board system, will have on his sales.

COSE not expected to ship until mid-1994

By Jean S. Bozman

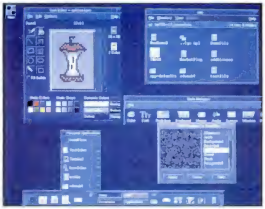
The look-alike graphical user interface for Unix systems, the Common Desktop Environment (CDE), will not be finalized until year's end, Unix vendors said last week. So corporate software developers who want to build CDE-compatible applications will have to work with sample CDE "implementations" released on a CD-ROM disk at a recent developers conference in San Jose, Calif.

Vendors' versions of the CDE code, due by mid-1994, will allow developers to write an application and deploy it on many Unix platforms. "Software developers could simply recompile when going from one platform to another," said David Smith, a senior Unix analyst at International Data Corp. in Framingham, Mass. "It would mean less costly software that would look and feel the same, regardless of what system it runs on." The compilers will be shipped with Unix vendors' operating systems.

For now, developers can prototype CDE-compatible applications, said Becky Austen, manager of AIX desktop products at IBM's Advanced Workstations and Systems Division in Austin, Texas. "The code is in an early form, and we would not suggest that people start developing production applications," Austen said.

The CDE disk contains sample code for systems made by Common Open Software Environment (COSE) founders Hewlett-Packard Co., IBM, SunSoft, Inc., Novell, Inc. and The Santa Cruz Operation.

UniForum in Santa Clara, Calif., distributed more than 1,100 CD-ROM disks at the CDE conference, but users can obtain more disks from the COSE vendors and UniForm.



CDE sample code *will let developers begin pilot projects*

By January, the Unix vendors who launched COSE expect to finish the final CDE specification, the CDE application programming interfaces and the underlying CDE code. If all goes as planned, CDE will be submitted to the X/Open Co. for review and testing and will be ready for vendor shipment by mid-1994.

Some users at large Unix sites said they are concerned that it will be hard to make many changes in CDE specifications. "I have the sense that they're moving in the right direction," said David Grubb, manager for standards and technology at Lawrence Livermore National Laboratory in Calif. "At this point, it's kind of like standing in front of a semi-truck and saying, 'Stop.'"

But vendors insist that the X/Open process includes user feedback. "X/Open has many people in the working groups who do not work for our companies," said Josina Arfman, an IBM program manager.

LICENSED USERS AND 8,000 32-BIT APPLICATIONS.

BENTO

Unisys takes client/server a step at a time

By Stephen P. Klett Jr.

In an effort to breathe new life into its proprietary CTOS operating system, Unisys Corp. has rolled out a client/server strategy replete with a new business unit, PCs, servers and software.

Unisys' strategy divides the client/server market into four target markets: downsizing, upsizing, networked PCs and replicated client/server. The company will focus its CTOS efforts on the latter, which is mainly composed of sites that have end-user services at branch offices and require systems that are easy to use and install — which Unisys sees as CTOS' strength.

"Our plan of attack is not to attack the total $100 billion client/server market but to take one target market at a time," starting with replicated client/server, said Donald E. Coleman, president of the new Unisys Client/Server Systems Integrated Business Unit in San Jose, Calif.

Coleman acknowledged that a key to CTOS' survival — bolding on to existing users while attracting new ones — is its ability to interoperate with Unix and Windows. During the first half of next year, the company plans to announce tighter Windows integration that will allow users to drag and drop between CTOS and Windows applications.

On the Unix side, Unisys announced availability of the Enhanced SNA software suite, which was designed to improve connectivity between Unix-based U6000 series systems and IBM SNA networks.

Unisys also rolled out additions to its CTOS SuperGen product line and PW2 Advantage PCs.

"Unisys has put some real teeth behind its client/server push," said Chris Christiansen, an analyst at International Data Corp. in Framingham, Mass.

Aiming high

Unisys has set ambitious goals for its client/server unit. Unisys plans to derive 20% of its revenue from the unit within three years. Analysts place the figure at less than 10% today.

Ready to commit

Christiansen said that Unisys needed to put the lines together under one business unit in order to convince users of its commitment to client/server.

"This turns their client/server push from a marketing club into a corporate business," he said. " It's one thing for a marketing message to fail — it's quite another for a business unit to fail."

The CTOS SuperGen line includes six new family members, ranging from Intel Corp. i486- and Pentium-based multiprocessing servers, priced between $4,400 and $11,400, to an i486SL-based notebook, which starts at $2,800.

Unisys also unveiled 10 additions to the PW2 Advantage series of PCs. The new machines include Pentium-based servers and workstations with integrated networking capabilities, new and enhanced midrange servers and desktops and a new line of entry-level, Energy Star-compliant systems starting at $799.

The systems run Microsoft Corp.'s MS-DOS, Windows and Windows NT Advanced Server; Novell, Inc.'s NetWare and UnixWare; The Santa Cruz Operation's SCO Unix; and IBM's OS/2.

Christiansen said that despite CTOS' installed base of one million, the platform is still unknown.

"CTOS doesn't have a lot of the buzzwords but it works incredibly well in a distributed environment," he said. "A big negative has been its proprietary nature, and Unisys is chipping away at this by putting it on Intel and integrating it with Windows."

While analysts said it appears that Unisys has put the right client/server lineup together, they said it still has to solve the problem of communicating its strategy to users. Toward this end, Coleman said the client/server unit will have a dedicated sales force with focused programs designed to push its products for each target market through both direct and "alternate channels."

While CTOS may not enjoy much time in the limelight, it is a hit at Lib/Go Travel, Inc. in Ramsey, N.J. The company has been using CTOS to run its mission-critical marketing and accounting applications for eight years and recently converted an i486-based SG6000 server to a Pentium-based SG7000, according to Robert H. Dever, vice president of information services.

Dever said that about a year ago Lib/Go began writing applications with Mapper, Unisys' fourth-generation language, which dramatically improved performance but has also spawned a deluge of new requests and raised applications' complexity levels.

Lib/Go chose to stick with CTOS in order to meet its distributed computing needs because it felt it was the most stable option available, Dever said. "What CTOS brings to the party is an OS that's been around for 10 to 12 years and has the maturity that length of time can bring," he said.

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Commentary

David Coursey

Keeping up with success



To say WordPerfect has been surprised by the success of its Office 4.0 electronic-mail/calendaring/scheduling system would be an understatement of some magnitude. Understanding this requires a trip to the third floor of Building M at the company's cookie-cutter campus in Orem, Utah, a 45-minute drive south of the Salt Lake City airport.

There, on a Friday morning last month, I found a development and support building that, judging by the way folks were running around, might have been on fire. Of course, had this been an actual emergency, no one would have noticed until one of the mail servers — how many were there, three dozen? — had begun to smoke.

Crammed into a former conference room, these systems provide messaging and calendaring for the company's 5,700 worldwide employees and serve as the most important testbed for Office 4.0 and its successors. (And no, it doesn't take that many machines for you to support a like number of users. They really do run some of everything they sell.)

It was in this room, called the "war room" by the development team, that I realized how sudden the success has been for Office, which now claims some 2 million users (400,000 of them added since June). WordPerfect seems committed to being a leader in desktop services such as messaging, calendaring and forms automation. The company also has a long and commendable history of desktop and server multiculturalism.

The downside of supporting multiple platforms is that today's most optimized Office installation would combine a NetWare Loadable Module (NLM) post office with OS/2-based gateway services and a collection of DOS, Macintosh and Windows clients. Even less optimized mail systems probably use two operating systems, with OS/2 likely to turn up some place regardless of what you're using. And since the NLM runs like a sealed primate, even sites that aren't wild about NetWare might set up a server or two just for WordPerfect Office.

Having created the kind of environment that spawns complexity, WordPerfect must make it a major priority to come up with a configuration that won't require a mail administrator to understand the guts of multiple operating systems. And there are other must-dos as well, such as improving the Macintosh client, adding still more Unix support and implementing a shopping list of features (some pretty cool) that are still on the Top Secret list. Software is being updated quarterly for some pieces, and you need a scorecard to keep track of all the beta releases, current and expected.

The developers are also working to build third-party relationships for add-on hardware and applications, while the top brass is eyeing what it will take to get the value-added reseller (VAR) and systems integrator support that could really propel the product into orbit.

Reinforcements on the way

If all this sounds confusing and hectic, it is. People here just can't seem to sit still. They know and, what's even rarer, they admit that they have lots of catching up to do. They don't balk at a recently published review that gave them low marks for installation support but simply concede that they didn't expect to be such a success and are coping as best they can. Reinforcements are reportedly on the way, and the company says it believes VAR and systems integrator support would provide the kind of installation hand-holding many customers desire and are quite willing to pay for.

A new name would also help. The first WordPerfect Office was developed before "office" became synonymous with "suite," but that doesn't change the fact that most people, when they hear the name, assume the product is a suite and that they have to have WordPerfect, the word processor, to use it.

In fact, the integrated E-mail, calendaring and scheduling package runs just fine with Microsoft Word, Ami Pro or whatever Unix geeks run these days.

WordPerfect Office is a good product that I'm betting will someday become a great one. If not, it certainly won't be for lack of ideas or initiative among the residents of Building M. But it also remains a work in progress. Customers used to expect that from software companies (how else did CC:Mail become such a big deal?) but are leery today of entrusting their critical systems to a company still in the throes of giving birth.

WordPerfect needs to get its Office in order — and that includes a new name and dramatically improved support — or risk alienating potential customers before they've had a chance to see what a nice product Office 4.0 really is.

Coursey is editor of "P.C. Letter," a San Mateo, Calif., industry newsletter. His MCI Mail address is 558-4460.

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NOT

Bank

CONTINUED FROM PAGE 75

pio said. "They're monitoring their positions on-line, and they're passing information back to the people in operations for clearance, settlement and accounting."

The treasury department also does database extracts that are fed to several PC-based data analysis systems, he said. Bank managers said they believe that the timely market analysis may spur more profits.

But all Unix transactions are posted to the bank's mainframes nightly, and database backups are made on the Unix network and in the data center. The update process is "kicked off" when IS staffers log on to the Unix workstation network through an X terminal in the data center. The updates and backups take the treasury systems off-line for about 90 minutes.

Until 1992, Sanwa Bank California — the state's sixth-largest bank, with $7.2 billion in assets — rarely ventured into the open systems arena. Most applications still run on large IBM mainframes in its Monterey Park, Calif., data center near Los Angeles. Departmental PC-based solutions run on Novell, Inc. LANs, and use of IBM RS/6000 Unix workstations is limited to parent Sanwa Bank Ltd.'s worldwide data network [CW, May 4, 1992].



Sanwa Bank's Lynn Ryan: *Unix servers may provide future model*

Changes on the way

That architecture is about to change, said Lynn Ryan, senior vice president of Sanwa Bank California and director of information services.

The success of the treasury system proved the concept of local manipulation of enterprise data and made it a model for future systems. "The packaged software was the primary solution," she said. "However, we designed the database analysis, the reports and some of the interfaces to other systems."

The qualitative benefits to Sanwa's business are substantial, Ryan said. "The value of the technology is that it allows them to use the information on call, rather than submitting a service request for [IS] programming," she said. "Our strategy, going forward, is for the departmental systems to be open. That will facilitate more end-user computing ability and [require] less centralized core processing services."

Ryan is trying to eliminate the storage of redundant data on PC databases since a shared server database is preferable for data integrity and accuracy. She also wants to see the Novell LANs become better integrated with Unix servers over time, weaving together horizontal office systems with networked database servers.

"We will look for opportunities to use the network for file transfer rather than for re-creating data," Ryan said.

The successful experience with Unix servers will also allow the bank to try similar solutions in other departments, Ryan said.

Other areas to be automated with open systems include a financial data repository built with a Sequent Computer Systems, Inc. machine running the Oracle database, she said.

Briefs

Colorado county outsources

Weld County in Colorado has signed a 10-year, $14 million outsourcing contract with **Systems & Computer Technology Corp.** in Malvern, Pa. Under the contract, Systems & Computer Technology will manage the county's information services department and direct its migration from a mainframe system to a distributed computing environment.

Profiting from government

Demonstrating that there can be commercial application for government-sponsored technology developments, **SunSolutions**, a **Sun Microsystems, Inc.** business, said it will make available by year-end desktop videoconferencing software developed by **Sandia National Laboratories**, a U.S. Department of Energy laboratory in Albuquerque, N.M.

Ethernet expansion in Japan

National Semiconductor Corp. and **NEC Corp.** have announced a partnership designed to expand the Ethernet market in Japan. The companies will codevelop a 32-bit 10Base-T Ethernet controller, and NEC will manufacture and market National Semiconductor's Ethernet LAN products.

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New Products

Citrix Systems, Inc. has announced an upgrade to WinView for Networks Version 2.2, its application server.

According to the Coral Springs, Fla., company, multiple users can simultaneously access DOS, Windows and OS/2 applications, regardless of the type of PC workstation or whether it is local or remote from the network.

Features in Version 2.2 include client drive support, automated client scripting, expanded remote node and client support, simplified Windows setup and support for applications running in Windows enhanced mode.

A 10-user system of WinView costs $2,645.

▶ *Citrix Systems*
(305) 755-0559

Starlight Networks, Inc. has introduced Starter Suite, a networked multimedia product.

According to the Mountain View, Calif., company, Starter Suite combines industry standard products from leading vendors in a low-cost system.

The product includes everything necessary to create a five-user networked multimedia application on an existing network of Macintosh computers or PCs.

The Entry Prototyping Kit version is a software-only video playback solution that offers an entry-level way of getting started with network multimedia.

The Extra Prototyping Kit provides software and hardware for video capture and playback. It was designed for users who want full-screen, full-motion video productions.

The Entry Prototyping Kit version for both the Macintosh and PC costs $4,995. The Extra Prototyping Kit for the Macintosh is priced at $17,500, and the Extra Prototyping Kit for Windows costs $11,995.

▶ *Starlight Networks*
(415) 967-2774

Data Exchange, Inc. has introduced WinDX, a client/server portfolio management system for Windows.

According to the New York company, the system incorporates all the functionality of its industry standard DX/V Portfolio Management System, with enhancements to usability and a reduction of hardware resources needed to support the system.

The product is a LAN-based system that provides trading automation, management analysis and complete back-office support.

Prices start at $100,000.

▶ *Data Exchange*
(212) 809-6868

Legent Corp. has announced Paradigm 2.0, an updated version of its problem management software.

According to the Vienna, Va., company, Paradigm 2.0 accurately tracks the actions and time taken to resolve systems problems against vendor, integrator or internal service level agreements (SLA).

This version also addresses critical customization and integration requirements for distributed systems management.

Users can monitor and measure vendor, integrator and internal problem response times and specific actions taken against contractual commitments with Paradigm 2.0's SLAs.

A Flexible Forms package is provided that lets users modify the look and feel of forms and add and delete files to meet with specific management requirements.

Paradigm installation prices start at $25,000.

▶ *Legent*
(703) 734-9494

InVision Systems Corp. has introduced VisionGraphics for inVision Video Conferencing for Windows.

According to the Vienna, Va., company, InVision transforms a Windows PC into a full-motion, real-time audio and video-conferencing workstation.

The document conferencing option, known as VisionGraphics, allows users to interactively collaborate and exchange ideas, designs, documents, spreadsheets and pictures. VisionGraphic's features include interactive annotation and a tool bar with colored markers, highlighters and erasers.

VisionGraphics also works with Windows or DOS software and costs $195.

▶ *InVision Systems*
(703) 506-0694

BLOC Development Corp.'s F3 Forms Automation Division has introduced F3 Pro Designer, F3 Design & Mapping and F3 Fill, re-engineering tools.

According to the Coral Gables, Fla., company, F3 Pro Designer automates the composition of preprinted business forms, replacing pens, graph paper and the T square.

Without using paper, F3 Design & Mapping creates an application that resembles and acts like a form. The product generates stand-alone forms applications for users who work with F3 Fill, the company's forms completion program.

F3 Fill is a tool that fills out, edits, saves, prints out and electronically mails or faxes forms.

F3 Pro Designer costs $1,500, F3 Design & Mapping is $3,000, and any style of F3 Fill costs $300.

▶ *F3 Forms Automation Division*
(305) 529-6939

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Government

No sure benefit in electronic services

By Gary H. Anthes
WASHINGTON

Local, state and federal agencies are accelerating the movement toward electronic delivery of government services, but there is no assurance this will improve services or reduce costs, according to the U.S. Congress' Office of Technology Assessment (OTA).

In a report that praises and criticizes government efforts to build and use information superhighways, the OTA said the effort risks "overlooking the human element and the need for affordable, user-friendly applications."

In "Making Government Work — Electronic Delivery of Federal Services," the OTA also warned that government efforts could widen the gap between the information "haves" and "have-nots" and the advantages that citizens who are educated and technically proficient have over those who are not.

Redesign necessary

The OTA said the federal government must redesign its outdated management structure for information technology applications and modernize laws dealing with privacy, security, pro-

Government, *page 88*

Group drafts graphics protocol

By Joanie M. Wexler

While videoconferencing vendors have been promoting their equipment as interoperable by virtue of the "px64" international video compression standard and long-standing voice conventions, a key component to an electronic conference has been left out of the loop.

There is no standard way for equipment to exchange graphics in a teleconference. This means that companies wishing to include whiteboard and other collaborative computing functions in their electronic meetings today are restricted to using one vendor's equipment.

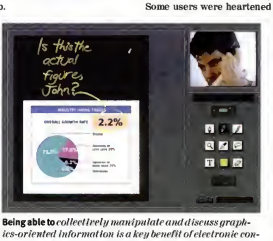
To speed up resolution of this situation — which limits companies' product choice and pool of eligible conferees — a group of 16 companies last week banded together to form the Consortium for Audiographics Teleconferencing Standards, Inc. (CATS).

The group's goal, announced at the TeleCon XIII trade show in San Jose, Calif., is to hurry along efforts by the International Telecommunications Union (formerly the CCITT) with what is called the T.120 standard for graphics, said David Belove, a CATS member from audio teleconferencing vendor Polycom, Inc.

The lack of a standard today "makes having a multimedia call impossible in a standardized environment," he said.

CATS would like the whole standard to be written by its members by year's end; the group will then submit it to the standards committee, Belove said. He said he expects implementations to get under way by mid to late 1994.

Some users were heartened by the efforts and said the graphics component of an electronic conference is more important to them than the video aspect.



Being able to *collectively manipulate and discuss graphics-oriented information is a key benefit of electronic conferencing, users said. Today it is restricted by the lack of a standard graphics exchange protocol.*

"You really do need the equivalent of a whiteboard or something you can present material on and [collectively] mark up," said Martin Yeas, a senior information systems analyst at electric utility Ontario Hydro's Grid Division in Toronto.

Currently, he said his group of engineers is more interested in comparing design notes, diagrams and drawings than seeing talking heads. He added that at some point, he would like to let field engineers join in the graphics and audio components of an electronic conference, but the video portion would be too unwieldy from "out in the hoondocks."

Graphics, *page 84*

HP opens its mailbag

By Lynda Radosevich
SANTA CLARA, CALIF.

Hewlett-Packard Co. added some punch to its OpenMail messaging line with product and partnership announcements and a strong strategy statement at the E-Mail World conference here earlier this month.

The strategy revolves around two main points that legacy messaging systems, while reliable and centrally manageable, lack flexibility; and that LAN messaging systems are friendly and flexible but don't scale or work well together and lack management features.

As outlined at the conference, HP's OpenMail messaging strategy addresses these issues by splitting back-end mail transport and directory services from front-end clients. OpenMail is based on X.400 addressing and X.500 directory services running on Unix-based servers. The servers natively support Lotus Development Corp.'s CC:Mail, Microsoft Corp.'s Mail and HP's own clients for DOS, Windows, Macintosh and Unix. The idea is that by integrating the back end, HP will reduce the need for gateways, directory synchronization and dedicated PC server post offices.

Specific announcements included OpenMail graphical management tools for tracking message traffic flow. HP also added migration services for moving Digital Equipment Corp.'s All-in-1 and CC:Mail users' information and stored data to OpenMail. HP started the migration service for IBM's Professional Office System (Profs) users in June.

Gateway choices

HP joined marketing ranks with message gateway vendor SoftSwitch, Inc. to increase OpenMail gateway options. On the client side, HP announced support for CC:Mail for Windows 2.0 and CC:Mail for OS/2 and announced new versions of its own clients.

Also, HP and Dexotek Canada Corp. announced a joint sales and support agreement and said that Dexotek's calendaring and scheduling product will run natively on the OpenMail backbone.

The company also plans to integrate OpenMail management into its OpenView network management system.

HP is not alone in this messaging backbone market. Lotus and Microsoft, the leading LAN-based electronic-mail vendors, have outlined strategies for robust hack-end messaging servers. However, product delivery dates are still about a year away for Microsoft and even longer for Lotus, whereas HP OpenMail has been on the market for two years, according to analysts.

For BellSouth Telecommunications, Inc. in Birmingham, Ala., that availability is what tipped the scale for OpenMail.

"Timing is a big issue. HP has a one- to two-year jump start on the PC vendors," said Julie Farris, a strategic planner at BellSouth.

BellSouth began an OpenMail pilot in June after spending a year developing a messaging strategy to support 40,000 end users.

Starting this month, the company is going into production with OpenMail, and Farris said she expects to have roughly 5,000 users up by the end of 1994 and more than 10,000 by the end of 1995.

Chief among the reasons for choosing OpenMail is its multiclient support, Farris said. That is because BellSouth already has a large population of CC:Mail and Notes users, as well as users of "all flavors of Unix" and Macintosh computers. The CC:Mail users will be migrated to the OpenMail hack end, and Unix and Macintosh users will have the OpenMail clients for their platforms.

Coming your way
HP OpenMail additions:

Fourth quarter '93
- OpenMail graphical management.
- Legacy migration services and tools.
- OpenView integration.
- Systems Network Architecture Distribution Services (SNADS) and Profs connectivity from LinkAge, Inc.
- SoftSwitch EMX modules.
- CC:Mail for Windows 2.0 support.
- Enhanced support for Microsoft Mail.
- HP client for IBM AIX.
- Enhanced HP clients for Macintosh, HP/UX and SunSoft, Inc.'s Solaris.
- Support for Microsoft Schedule+.
- Scheduling software from Dexotek.

First quarter '94
- Native support for CC:Mail for OS/2.
- Vendor Independent Messaging 2.0.

Also, the LAN messaging platforms — with their DOS-based file-sharing post offices — were not scalable enough, BellSouth considered an X.400-based messaging backbone from Digital but its "ability to deliver was not there," Farris said.

One concern Farris has is that OpenMail clients have a consistent feature set so that they are easier to support. HP announced that it is addressing dissimilarities in their look and feel.

Client/server

Network speeds access to Duke hospital records

By Gary H. Anthes
DURHAM, N.C.

Health care reform may be all the rage this year, but the Duke University Medical Center has been using an information system to improve services and control costs since 1968.

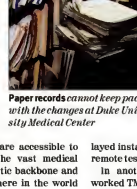
Now, The Medical Record (TMR) system, which has evolved continuously over a quarter-century into a comprehensive tool for doctors, nurses, administrators and 400,000 patients, is about to give way to a client/server implementation that will spread large and complex databases of medical records across multiple servers working in parallel.

TMR, in its current incarnation, runs on Digital Equipment Corp. VAX minicomputers attached to PCs acting as dumb terminals. The VAXs are accessible to doctors throughout the vast medical complex via a fiber-optic backbone and by connections anywhere in the world over the Internet.

TMR, in its more recent networked configuration, has enabled significant cost-savings in ways that were not at first envisioned, said Professor William E. Hammond, head of the Division of Medical Informatics.

For example, bone marrow transplants used to require very costly 30-day hospital stays. Now, patients stay three days for the transplant and then go to motels near any of a number of outpatient clinics around the state. The results of daily follow-up tests at the clinics are sent electronically each day to TMR, where they are reviewed by patients' physicians.

"The patient could be in any of four or five places; the paper records would never catch up," Hammond said. "The only way to update the record [in a timely way] is to do it electronically."



Paper records *cannot keep pace with the changes at Duke University Medical Center*

TMR is used in Duke's Surgical Intensive Care Unit, where some 75 nurses use bedside terminals to enter "head-to-toe assessments" of patients, said Johnetta Bowen, nurse manager. She said it has improved the quality of care over the old paper-intensive procedures. For example, the results of laboratory tests can be relayed instantly to operating rooms from remote test facilities, she said.

In another application of the networked TMR, Duke set up an integrated database of pregnant women to track prenatal care, no matter where it was given. Hammond gives the system partial credit for reducing the number of fetal deaths in the county from 12.7 per 1,000 pregnancies to 8.1 per 1,000.

Now, Hammond said, the time has come to take advantage of the enhanced performance and graphical user interfaces available with more modern technology. His staff will rewrite TMR in a combination of C and C++ and put it on 10 LANs around the medical complex. Each LAN will have multiple Intel Corp. 1486-based servers running Microsoft Corp.'s Windows NT.

In the Family Health Center, for example, there will be 200 to 300 PCs attached to four servers. Hammond said he does not know yet just how the work load will be distributed across the servers. One possibility is to split the database into four parts by patient Social Security numbers. Another is to put the entire database on each server and have a front-end route requests to the least busy CPU.

The multiple server approach is needed to guarantee the top performance and near-100% uptime required by the mission-critical application, Hammond said. In addition, it will make the systems easy to scale up as volume grows, something not easily accommodated with the VAXs.

Sifting on top of the 10 LANs will be a central patient index pointing to subsets of patient records in cardiology, the bone-marrow transplant unit, the family health unit and so forth. In ways not entirely worked out, the index will be used to route users to the appropriate medical department and database.

Hammond estimated it will take 12 people 18 months to develop an alpha test implementation of TMR. Total development cost over two years will be about $2.7 million, he said.

Hammond said he hopes Duke will be able to market the new TMR to other medical centers across the country.

Storage that keeps on saving

When the Duke University Medical Center brings up a client/server version of TMR, the application code and hardware will be brand new, but the data storage structures will be carried over unchanged — the legacy of years of refinement.

To support medical research, all data for patients — even the deceased — is kept on-line at all times. That, plus the requirement for rapid access in medical emergencies, has led to a Duke-developed hybrid storage approach that uses 10 data architectures, including hierarchical, relational and object-oriented structures, inverted files, hash files, B-tree files and sequential transaction files.

The approach maximizes performance and storage efficiency for each type of use, said William E. Hammond, head of the Division of Medical Informatics. For example, a patient-billing application would access a transaction file, physician inquiries would typically use a patient-keyed structure and medical researchers might use an inverted file to look for specific treatments and results across entire populations of patients.

— Gary H. Anthes

Briefs

Las Vegas: Fast town

Wireless network service provider **Ardis** announced earlier this month that it has brought the Las Vegas portion of its network up to 19.2K bit/sec. speeds and will demonstrate those speeds at this week's Comdex/Fall '93 show there. The enhancement marks the second Ardis-served city to get the faster speeds; Washington was upgraded earlier this year. The 19.2K bit/sec. speeds are the fastest to date in wireless wide-area networks.

Hub costs drop

Allied Telesis, Inc. in Mountain View, Calif., recently announced a 25% across-the-board reduction in list prices for its stackable Ethernet wiring hubs. The price range for the six-, eight- and 12-port hubs has dropped from between $1,595 and $3,195 to $1,200 and $2,400.

Infonet gets Nifty

Global value-added network service provider **Infonet Services Corp.** is providing access through its x.25 public data network to **Nifty Corp.**'s on-line subscriber service, called Nifty-Serve. Nifty-Serve has more than half a million subscribers in Japan.

Alfa teams with Xyplex

Alfa, Inc. in Hyannis, Mass., has teamed with terminal server company **Xyplex, Inc.** in Boxboro, Mass., to integrate Alfa's Fiber Distributed Data interface (FDDI) concentrator technology into Xyplex's Network 9000 Routing Hubs. The effort includes Alfa's copper-based FDDI products.

3Com adds reseller

3Com Corp. recently signed up Anixter, Inc. as a 3Com Network Systems Integrator, which means Anixter in Skokie, Ill., will resell 3Com's networking products.

Graphics

CONTINUED FROM PAGE 83

Yeas said he is pushing for standards because "we don't want to be limited to a specific vendor" for product selection. Currently, the company uses proprietary graphics software from just one supplier, WorldLinx Telecommunications, Inc.

Also, some companies are concerned about standards as their electronic conferences move beyond their own corporate borders. Business partners that are potential conference mates could have installed gear and software from any number of vendors with proprietary graphics-exchange algorithms.

"We have a big desire to mix and match" equipment, said Nick Di Iorio, director of networking and telecommunications at worldwide advertising agency Young & Rubicam, Inc. in New York. Di Iorio said the main purpose of the agency's conferences are to show storyboards and layouts to clients.

The agency's corporate standard for video equipment is PictureTel Corp. gear.

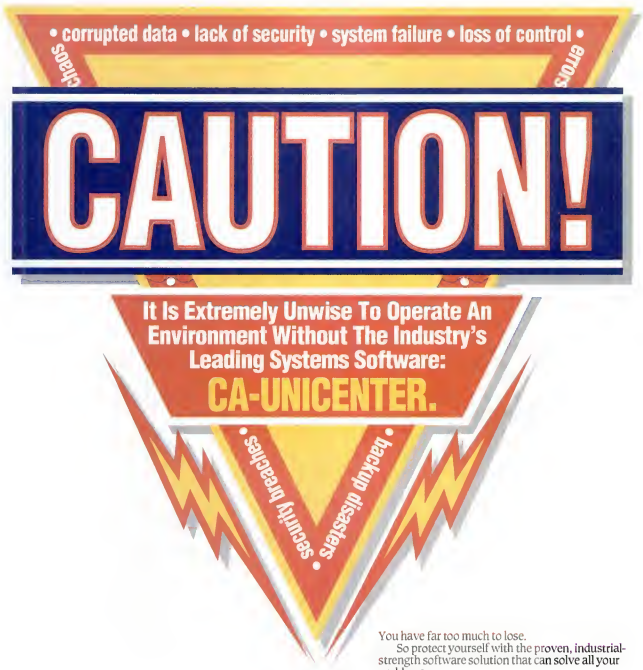
About half its clients with videoconferencing systems use PictureTel, and the other half use Compression Labs, Inc (CLI), Di Iorio explained.

"With the CLI people, we can't exchange graphics," he said. "This is obviously something that should have been resolved by the vendors; they standardized on audio and video, then they deadlocked" over graphics.

Another area the graphics standard could affect is customer service, said Russil Halhed, president of Halhed Enterprise, Inc., a consulting firm in Ottawa.

According to Halhed, there is a trend among companies to start talking electronically to suppliers. "If you're a high-tech company, for example, you can [collaborate on] a printed circuit board and show what is going wrong."

Tim McElgunn, an associate analyst at Datapro Information Services Group in Delran, N.J., said the users he talks to find "a lot of value" in the graphics component. On the flip side, he said, "show me a very rich still video or whiteboard manufacturer," indicating that the market is still in its infancy.



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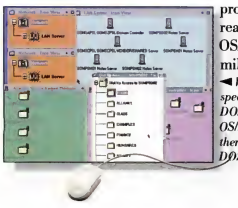
Domain/DACS,™ AlertView,™ Foundation Manager™), and more. **Fact:** The NT strategy is still Not There, and neither are native client/server applications.

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Kiosks handle employment queries

By Ellis Booker

A prototype unemployment office featuring self-serve kiosks opened last month in Arlington Heights, Ill.

Called Touch Illinois, the system is a joint project of the Illinois Department of Employment Security (IDES), IBM's Advanced Interactive Systems Group in Chicago and the Interactive Transaction Systems Group at IBM's T. J. Watson Research Center in Hawthorne, N.Y.

IDES expects to increase its productivity through the kiosks because they are self-serve and will eliminate some paper-based chores.

For instance, the agency estimates the kiosks will reduce the time it takes to process a claim from two hours to about half an hour. Complex cases are routed to agents via a work-flow subsystem.

"We anticipate freeing up our employees to help people find new jobs," said an IDES spokeswoman, who added that the department is not planning to layoff any workers as a result of the automation.

"We took a great deal of care to make the system 'user-seductive,' " said Jeff Mortner about the system's "video game-like" interface. Mortner is team leader at the Advanced Interactive Systems Group and project manager for the Touch Illinois project.

One important design consideration, he said, was to avoid alienating or intimidating users. For this reason, Mortner's group vetoed the use of retina scans to identify individuals. Rather, users show some form of identification to a receptionist and then are given a Touch Illinois card to enter the kiosk system.

Getting connected

The kiosks are based on IBM PS/2s running the OS/2 Version 2.1 operating system and are linked over a Token Ring LAN. A larger PS/2 with 1G byte of storage and 24M bytes of RAM acts as a server. The system communicates with the IDES mainframe system based in Springfield, Ill., by using IBM's Advanced Program-to-Program Communications over a dedicated phone line.

The pilot system, now working with 12 kiosks, will soon be expanded to 25.

Future enhancements to Touch Illinois include placing the kiosks in IDES offices throughout the state, as well as in public buildings such as community colleges, libraries and shopping malls.

Ultimately, in-state employers looking for workers may be able to link directly into the IDES job applicant database.

Government

CONTINUED FROM PAGE 83

curement and freedom of information. "It may be necessary to revise the concept of universal telephone service to include advanced telecommunications and computer networking," the report said.

The concept of electronic government is a cornerstone of the Clinton administration's "reinventing government" effort, but currently, the government lacks the overall strategy and vision needed to achieve the goals set out recently in Vice President Al Gore's National Performance Review, the OTA said.

For example, the OTA said the government has demonstrated the technical feasibility and utility of electronic benefits transfer, especially for food stamps. But it "is not likely to be cost-effective for delivery of federal benefit programs if each agency or state goes its separate way," the OTA said.

The OTA called for a coordinated and integrated electronic benefits transfer effort by federal agencies, state and local governments, banking and electronic funds transfer systems and others.

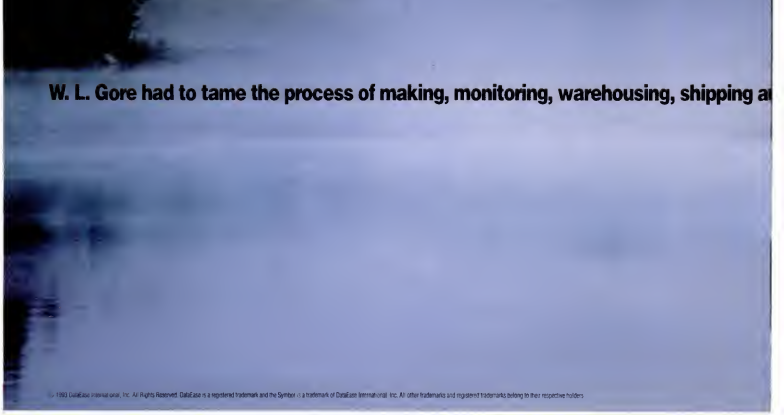
"The [National Performance Review] documents set a general direction and some degree of vision for use of information technology," said Fred Wood, senior associate and project director for the OTA study. "But they are very vague and fall well short of what's needed to make things happen."

Wood acknowledged that the performance review team is preparing a detailed report on its information technology program, but he said it is likely to be specific in only a few areas. He said he hopes Congress can use the OTA report as a checklist or benchmark for evaluating administration proposals.

Community left out

The OTA said the federal government generally fails to involve the local community infrastructure — including schools, libraries, senior centers and town halls — in its electronic delivery projects. "That has not been done much in the past. It's not in the culture. It's something easily overlooked or manipulated," Wood said. "We're saying, 'Do something that has hite, mandate it, put some resources into grass-roots involvement as part of every electronic delivery project.' "

"This OTA study rightly points out that in the past decade, state governments have taken the lead in electronic delivery services," Rep. George Brown (D-Calif.) said in a written statement. "A similar transformation in service delivery is inevitable at the federal level."



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Commentary

Franco Vitaliano

Beware the butterfly effect

Warning: Don't place too much faith in the latest and greatest SNMP2/NetView/DME/OSI-compliant/network framework.

The arrival of large-scale distributed client/server applications is likely to unleash forces beyond the diagnostic and preventive powers of network management systems.

The reality is that your network and its associated systems can be up and stable and problems can still develop when you try to implement a large-scale distributed client/server application.

Something gone wrong

Imagine yourself in this situation: The network management system says everything is A-OK and both the server and client system diagnostics check out, but you still have a problem of sluggish network performance — or worse yet, data corruption. What then?

This is the point at which the dreaded finger-pointing really starts in earnest. Is it the user? The WAN provider? Weird interactions between this application and some other code? Is it the operating system? Who do you call in first?

Most likely, what you'd do is start tearing things apart piece by piece, working off a short list of likely candidates. Then, when that proved futile, you'd move on to the long list.

Maybe you'd get lucky and finally discover a tiny systems interaction bug buried deep in several million lines of code. This would be the kind of bug that wouldn't show up during testing and deployment of the new application; it would activate only when a unique set of conditions interacted in exactly the right star-crossed way. When all the conditions collided and the bug was unleashed, the system would have done exactly what it was supposed to do: promptly shut itself down.

Finding such a bug would be a best-case scenario. It is also possible that you could tear everything apart and find absolutely nothing wrong.

Sound impossible? It's not. And, as your distributed applications become more complex, and the processing intelligence becomes ever more diffused, this no bug/big crash scenario is going to happen to you one day. Please note that I said *will* happen, not *may* happen.

Bernardo Huberman, a research fellow at Xerox PARC, has written extensively about this new type of network systems failure. He likens large complex computer networks to biological ecosystems.

Natural chaos

In nature, when something gets just big enough, and complex enough, localized chaos occasionally sets in. The irony is that such chaos is not unnatural. Quite the contrary, it seems to be integral to the natural scheme of things. Consequently, small sections of an ecosystem can suddenly become chaotic. These localized effects may also alter the state of systems far removed from the event.

This is sometimes called the "butterfly effect," referring to the theory that a small insect fluttering its wings somewhere over China somehow plays a role in triggering a hurricane that storms up the Florida coast.

Huberman believes complex computer "econets" are susceptible to crippling the chaotic events. So next time you contemplate deploying a multiyear, multimillion-dollar network application, think about that little butterfly over the Asian landmass.

Vitaliano is a principal at VXM Technologies, a Boston-based networking software developer.

Briefs

Modem maker cuts tags

U.S. Robotics, Inc. has reduced the prices on its Sportster line of fax and data modems. The company's $219 to $329 line of products has dropped to between $179 and $279.

NEC, National Semi team

National Semiconductor Corp. and **NEC Corp.** have signed a semiconductor technology partnership agreement aimed at expanding the Japanese market for Ethernet-based PC and systems networking. The companies will jointly develop a low-power Ethernet controller, and NEC will manufacture and market National Semiconductor's family of Ethernet products under the NEC logo.

Manageability grows

Newport Systems, Inc. in Newport Beach, Calif., recently announced that its router products will gain a snap-in module that allows them to be managed centrally by **Novell, Inc.**'s NetWare Management System.

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New Products

Watch Hill Research has announced the IPX Accelerator, a data compression product.

According to Coventry, R.I.-based Watch Hill, the IPX Accelerator and the Mini-IPX Accelerator compress data for transmission from 56K to 2M bit/sec., enabling Novell, Inc. network users to increase overall network throughput by 200% to 600%.

The IPX Accelerator supports all Novell protocols and was designed for higher speed links up to and including T1/E1.

The Mini-IPX Accelerator operates on networks at speeds of 56K to 256K bit/sec.

The IPX Accelerator and the Mini-IPX Accelerator cost $9,000 and $4,000, respectively.

▶ *Watch Hill Research*
(401) 826-0005

Software Artistry, Inc. and **Service-Ware, Inc.** have announced Knowledge-Paks, a product line offering help desk troubleshooting expertise in a ready-to-use form.

Knowledge-Paks was designed for Software Artistry's Expert Advisor help desk automation product.

According to Indianapolis-based Software Artistry, each Knowledge-Pak contains complete troubleshooting instructions for a particular office automation product such as Windows 3.1, Microsoft Corp.'s Excel 2.0 and Word 4.0 and Novell, Inc.'s NetWare 3.1.1.

Detailed step-by-step problem-solving strategies, descriptions of error codes, instructions for recovering from system failure and hundreds of problems and solutions are provided.

Knowledge-Paks costs $5,000 for the first 10 seats per domain.

▶ *Software Artistry*
(317) 876-3042

Wall Data, Inc. has introduced Rumba Office connectivity software.

According to the Redmond, Wash., company, the product provides users with universal access to multiple applications on multiple-hosts mainframes — IBM's AS/400s and Digital Equipment Corp.'s VAX/Unix machines — from a Rumba software "Window," a single Windows interface.

Rumba Office features include multiple host connectivity; batch, drag-and-drop file transfer; enhanced nonprogrammable terminal user interface; floating tool bar; selective install; Rumba Office Manager; Rumba Office Workspace; Configurable Rumba; and client/server support.

Rumba Office costs $500 per single-user license.

▶ *Wall Data*
(206) 883-4777

Microcom, Inc. has announced two 28.8K bit/sec. V.fast modems.

According to the Norwood, Mass., company, the Microcom DeskPorte Fast desktop fax modem and the TravelPorte Fast portable fax modem take advantage of a PC's high-speed parallel port to deliver V.fast throughput speeds of 115.2K bit/sec.

Both products provide hardware and special PC drivers that reroute data via the PC's high-speed parallel port.

Other features include the following: flash memory, CCITT standards support, security features, Windows fax software as well as LCD display/LEDs.

Microcom's V.fast modems support Microcom Networking Protocol Class 10, the de facto standard designed for high-performance data communications that enable users to get connected and stay connected.

The Microcom DeskPorte Fast desktop fax modem and the TravelPorte Fast portable fax modem cost $499 each.

▶ *Microcom*
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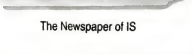


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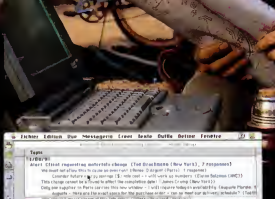
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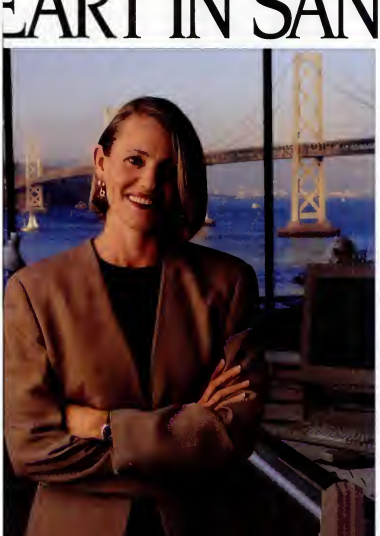


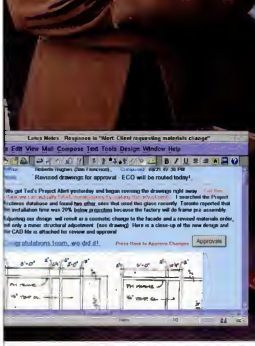
Following a client meeting, Ted, the Account Manager in NY, enters a Project Alert in the Project Tracking Database, describing some last-minute client changes. All key individuals on the project are automatically notified. He includes a spreadsheet comparing prices from the Notes Supplier Catalog database.



Thierry, the overseas site manager in Neuilly, is paged via Notes, and sees the Alert (as well as responses from other team members) from his Powerbook™ at the site. He responds that chances are possible only if the ECO and proper procedures are completed within 24 hours.

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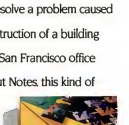


Roberta, the architect in San Francisco, gets to work on the drawings. But first, she checks the Project Archives database and reads about a similar job in Toronto where money was actually saved even though material costs increased. She sends the revised drawings, including the details on the Toronto job, for the team's approval.

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Unix systems

Pyramid plans MPP machine

By Mark Halper

Pyramid Technology Corp. recently quadrupled its systems performance with the introduction of its Nile boxes, but users and analysts said they expect a quantum leap late next summer, when the company plans to unveil a massively parallel system.

Code-named Meshine for the "mesh" technology that will interconnect processors and memory, the system will scale up to 256 processors, according to John Jones, a San Francisco-based analyst at Salomon Brothers, Inc.

Nile accommodates up to 16 processors in a symmetrical rather than parallel layout [CW, Oct. 4].

San Jose, Calif.-based Pyramid will time Meshine's introduction to coincide with Oracle Corp.'s anticipated unveiling of a database designed to exploit massively parallel designs, and with Unix System Laboratories, Inc.'s introduction of a massively parallel Unix operating system, Jones said.

Although Pyramid licensing partner ICL recently introduced its own massively parallel system, Pyramid will not use ICL technology.

Users would benefit from the system's ability to spread a single task among several processors rather than disb out those tasks in whole to various processors, a more time-con-

Pyramid, *page 103*

Data repositories

On the slow road

Repositories may be winning users' hearts, but technical challenges remain

By Johanna Ambrosio

Successful repositories are built one subject or business division at a time, implementors say. Still, creating these directories is a slow and painful process rife with frustration and technical challenges.

Repositories are essentially the "Yellow Pages" of corporate information. They provide the location where the user can turn to find the information he requires. The repository does not contain the data itself; it merely serves as a road-map to find the data.

In some cases, the repository contains information about application development projects going on around the company — which developer has which piece of the project, for example. In other cases, the repository is used to keep track of subject- or division-specific data that users request.

Need for speed

People charged with implementing these directories talk of increasing acceptance of the need for this corporate resource, particularly as client/server systems make data harder to find and track. "Some of our users are begging us to go faster," said Kristy Bruce, a repository administrator at Eli Lilly and Co. in Indianapolis.

But that is a double-edged sword because users who are promised information not available to them before may expect overnight miracles.

Managing end-user expectations is a big part of the repository job, according to implementors who gathered at a Repository/Architecture/Development user group held recently in Chicago.

What's it worth?

Another challenge is finding the money to do the work. Although the benefits of a repository may seem apparent, they are not always easy to quantify in hard dollars.

"How are the benefits measured?" asked David Swan, assistant director of data architecture at the Group Health Cooperative of Seattle. "As soon as I make it easier for people, my backlog triples. No matter how productive you get, nobody outside of IS will ever believe you."

Swan suggested letting the end users or the programmers — whichever group uses the repository — figure out what the effort has been worth to them in time saved or increased productivity.

Repositories, *page 106*

Benchmark benefits

Data center managers share, compare results

By Thomas Hoffman

Ever wonder how your data center operations stack up against the competition's?

The question was intriguing enough for 10 companies, including Texaco, Inc., The Travelers Corp. and Texas Instruments, Inc., to form a "best practices" group 18 months ago to exchange dialogue on how each participant approaches key data center functions.



The group was co-sponsored by the United Services Automobile Association (USAA) and Real Decisions Corp., a Darien, Conn., consultancy that conducts an annual benchmark of more than 200 U.S. corporate data centers. While the benchmark compares each company's data center activities with those of other firms with comparable MIPS and infrastructure parameters, the statistics are kept anonymous and confidential.

In 1991, the companies formed the best practices group to better determine why they were ranked favorably or otherwise in areas such as problem management, systems support and

Benchmark, *page 101*

See story on **benchmarking resources,** page 136

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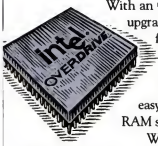


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Briefs

Argonne gets Power Parallel

Argonne National Laboratory has acquired a 128-processor version of the IBM Power Parallel supercomputer. Groups of researchers from universities, corporations — including Amoco and Allied Signal — and other national labs will all use the supercomputer and will help test it.

Digital combines units

Digital Equipment Corp. has combined the five customer business units it formed earlier this year with its worldwide sales and marketing organization. The business units are now overseen by Edward Lucente, vice president of sales and marketing who had previously reported to Robert Palmer, Digital's president and chief executive officer. Digital said it hopes the combined organization will be more efficient and added that Palmer also wanted to reduce the number of his direct reports, which totaled 19 executives before the reorganization.

Graphics accelerators

IBM plans to remarket high-end graphics accelerators that are made by **Evans & Sutherland** for its RS/6000 family of computers.

Bull introduces mainframe line

Its high-end strategy will be built around new DPS 9000/900 machines

By Craig Sledman

Groupe Bull recently expanded its DPS 9000 mainframe line with six models based on NEC Corp.'s hardware and its own GCOS 8 operating system. The he-leagured French company also said it has started early development work on a CMOS-based parallel processor akin to IBM's Power Parallel system.

However, Ted Raffel, U.S. business development director for enterprise systems, said Bull's high-end strategy will be built around the new DPS 9000/900 machines at least through 1996. Bull is still "trying to determine the rate that we would implement" the parallel technology, he added.

Whether Bull has the staying power to wait several years for a new approach is unclear, said Carl Greiner, a large systems analyst at the Meta Group, Inc. consultancy in Westport, Conn.

The DPS 9000/900 "does not warrant them to be considered as a long-term architectural player," Greiner added.

Code-named Zeus and rated for twice the performance of Bull's existing mainframes, the DPS 9000/900 models are scheduled for general availability in late March, according to Raffel. He said the company hopes to ship 100 to 150 of the machines during the next five years.

Bull's mainframe business still totals about $1 billion per year, Raffel indicated. Sales are expected to be down by 5% or so this year, partly due to concerns with the company's precarious financial position, which recently forced the French government to propose another cash infusion.

Along with the DPS 9000/900, Bull also introduced a gateway to the Open Software Foundation's Distributed Computing Environment (DCE). The product allows the mainframes to access data and services such as distributed printing that reside on DCE-equipped Unix systems, Bull said.

Bull also unveiled software that enables its mainframes to do some transaction processing work in conjunction with Unix machines running NCR Corp.'s Tuxedo transaction monitor. However, Raffel noted that transactions can only be updated in one direction at a time for now.

Two-way commit capabilities are in the works, and Bull is thinking of adding support for IBM's CICS transaction processing software, Raffel said. A more complete offering may be added next fall, although the time frame "will depend on customer demand."

Zeus ex machina

Base pricing and specifications for the entry-level and high-end models in Bull's DPS 9000/900 mainframe line, code-named Zeus

	DPS 9000/971	DPS 9000/994T
Central processors	1	4
I/O processors	1	2
System control units	1	2
Main memory	128M bytes	256M bytes
Performance	364 trans./sec.	2,020 trans./sec.
Price	$5.9 million	$31.6 million

Source: Groupe Bull

Benchmarks

CONTINUED FROM PAGE 97

technical support head count.

"It was time to pull back the next layer and look at what other companies were doing better on the Real Decisions metric and whether those practices can be brought to bear in our shop," said Bob Horansky, director of information systems at The Travelers, a Hartford, Conn., insurance and financial services firm.

Steve Groce, manager of operations in information services at TI's Plano, Texas, worldwide command center, was more blunt about his interest in the group.

"If you don't come out as the best, you want to find out why," he explained. Groce said the Real Decisions 1991 data center benchmark indicated that TI had underperformed relative to comparable data centers in areas such as MIPS use and hillable MIPS to customers.

The benchmarking partners meet quarterly, following up those discussions with monthly teleconferences.

Technical services

One of the first areas the group explored was technical services head count, according to Don Perez, manager of change and problem management at USAA, an insurance firm in San Antonio.

"In some technical services areas, such as operating systems, we looked real good," Perez said of the benchmark results. In other technical support areas, such as internal systems support, USAA fared less favorably, he said.

The best practices group, Perez said, also helped him identify why USAA fared so well in areas such as capacity planning. One of the main reasons Perez wanted to schmooze with his peers was to justify for his bosses why certain subsets of USAA's data center operations are the best of breed.

"If you want to go out there and do internal subsystems support [benchmarking] against a Texas Instruments or Texaco, you want to know some of their priorities and confirm that you're heading in the right direction," Perez said.

Despite its unfavorable MIPS-use ratings, TI has not made any demonstrable changes to its operations from the feedback Groce has gathered from other best practices confidantes, he said.

Benefits

"We feel comfortable where we are, even though we would like to be more cost-effective," Groce said. He added, however, that other input he has received from the group's participants in areas such as problem management, change management and help desk have helped influence his company's data center decisions.

Two of the participants, Perez and Mike Jones, manager of Texaco's Bellaire, Texas, data center operations, said their companies have received tangible benefits from the brainstorming sessions. "Other companies had better service-level agreements than we had," Jones said. "That has helped us to rethink the value of our service-level agreements and how they may or may not be used as a tool to improve relationships with our customers."

Perez said he used feedback from Jones on how the petroleum giant addresses problem management with its vendors. Perez said USAA adopted Texaco's "scorecard" approach to ranking its hardware vendors on a monthly basis in areas such as a failure to meet a timely preventive maintenance schedule. Since implementing the ratings for its five primary hardware vendors several months ago, USAA has received considerably better service, Perez said, though he was unable to quantify those changes.

And by networking with his data center peers, Horansky at The Travelers said he has likely avoided having to bring a consultant into his shop to gauge future projects because some of his cronies have already embarked on these endeavors and helped guide his early steps.

Indeed, the best benchmarking practices are those that bring tangible benefits to participating companies, according to Brian Lowenthal, managing director at The Benchmark Partners, Inc., an Oak Brook, Ill., consultancy that specializes in benchmark processes.

"I'm a proponent that if you can't have quantifiable benefits from the benchmarking initiative, you probably didn't approach it properly," Lowenthal said.



TI Manager of Operations Steve Groce *said peer input influenced his decisions*

Code of conduct

Because the best practices group included insurance industry competitors such as USAA and The Travelers, it decided to avoid conflicts by incorporating the American Quality Institute's Code of Conduct at its first meeting, according to USAA manager Don Perez. The measure was adopted to ensure that proprietary corporate information discussed at meetings be kept sacred.

Client/server arena

The USAA-cosponsored best practices group plans to broaden its discussions to include the challenges facing historically mainframe-centric shops as they move into the client/server arena. But before those issues are raised, there is still a bevy of data center-related topics to explore, including recovery management, Jones said.

Besides, client/server is the basis for a second Real Decisions best practices group, cosponsored by McDonald's Corp., that met for the first time last week, noted Tom Janus, home office director at the Oak Brook, Ill., fast-food franchise.

Conde Nast melding HP 3000, PCs

By Mark Halper
LONDON

For Conde Nast Publications Ltd.'s business and commercial operations, relying on a proprietary Hewlett-Packard Co. minicomputer has meant conforming to old hierarchical computing procedures, even for end users who access the mini through PCs.

But MIS manager James Bedster hopes to soon install technology that will move the publishing company's HP 3000 minicomputer into a distributed computing scheme that would spread processing among some 100 PCs. Sales and production staffers use the PCs to track advertising bills, payments and copy.

Bedster's aim is not only to speed up PC access of 3000-resident data but to distribute processing to about 10 486-based servers.

"You can't keep throwing stuff at the 3000 and hope it's going to do it," Bedster said. Conde Nast has continually added functions to the HP 3000, such as an editorial system that tracks writers' and photographers' costs, he explained.

One other factor driving the move: Conde Nast wants to simplify life for end users who have to operate in two different environments — Windows, for tasks such as word processing and spreadsheets, and the-menu driven HP 3000.

"They have to have a compleiely new set of commands, and they want to know why they can't use the same ones they are accustomed to," he said. "So we want to give a Windows feel to our system."

The company is now evaluating development tools that it will use to build a PC-to-HP 3000 interface.

In the present mode, the company ties PCs into the HP 3000 through Walker Richer & Quinn, Inc.'s Reflection emulation software. Another 30 or so end users still use terminals to access the 3000 and its proprietary database, HP's Turbo-Image.

Distributing the tasks

Bedster referred to the installation of Reflection in 1992 as "a first step" toward a distributed environment. The move enabled the company to put its PCs to work for tasks other than isolated chores such as word processing and spreadsheets.

"But effectively, we're still using the PCs as dumb terminals," said Bedster, who pointed out that while Reflection enables the PCs to draw data from the HP 3000's database, it does not permit free swapping from one PC to the next. "The challenge is to distribute the processing of the data out to the [PCs]," he said.

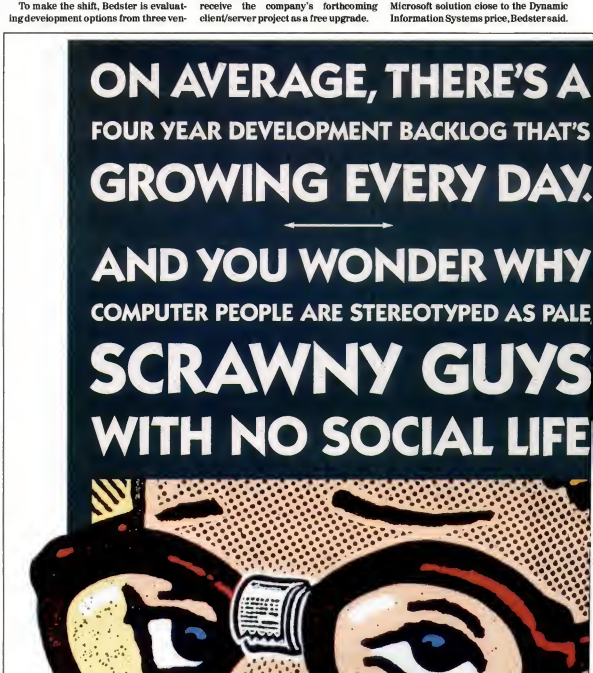
The 70 PCs already sit on a Novell, Inc. NetWare LAN and Microsoft Corp. LAN Manager LANs that support a total of 250 PCs at Conde Nast for other operations, including classified advertising. But they bypass those networks to communicate with the HP 3000 through a slower asynchronous link, which Bedster said he hopes to eliminate.

Denys Beauchemin, a Houston programmer at database tool vendor Hicomp America, Inc., cautioned that moving to a client/server mode with the HP 3000 is advisable as long as the user does not put a heavy transaction load on the network. Bedster added that Conde Nast has limited on-line transaction processing needs.

To make the shift, Bedster is evaluating development options from three vendors: Speedware Corp., Microsoft and Dynamic Information Systems Corp. He said he expects to make a decision within six months.

The least-expensive option could be Speedware because Conde Nast is already a Speedware licensee and should receive the company's forthcoming client/server project as a free upgrade.

Microsoft's Visual Basic would cost about $300, and Dynamic Information Systems' product would cost a "few thousand" dollars, Bedster estimated. But the product would include process-to-process linking (PPL), which Conde Nast would have to purchase if it were to decide on the Speedware or the Microsoft product, he said. And the PPL element could make the cost of a Speedware or a Microsoft solution close to the Dynamic Information Systems price, Bedster said.



Pyramid plans MPP machine

CONTINUED FROM PAGE 97

suming technique employed in symmetrical schemes.

Craig Sultan, an analyst at Montgomery Securities in San Francisco, said large retailers and travel industry companies could benefit from faster searches and interpretations of massive databases that could contain terabytes of information.

A central office of a large retail chain, for instance, might want to analyze how tie-dyed T-shirts are selling in hundreds of stores around the country.

Pyramid director of product marketing Judson Groshong declined to provide product details.

He noted, however, that Pyramid is developing what be called a "massively scalable" architecture intended to extend the clustering capabilities well beyond the maximum four-box clusters that Pyramid now supports.

A reservation clerk at a hotel chain could use the system to simultaneously obtain property, map and room inventory information rather than run separate queries for all three, said Bill Rieke, director of strategic systems at The Promus Cos., the Memphis-based owner of Embassy Suites, Hampton Inns and Homewood Suites.

"You could cut down on the amount of time it takes to handle a call at the reservation center," said Rieke, a Pyramid customer who said his chief concern before implementing massively parallel technology would be reliability.

Sultan pointed out that unlike some of the massively parallel vendors that sell to scientific markets, Pyramid is focusing on the needs of the commercial world.

"The kind of sale you make to Wal-Mart is different than what you make to NASA," Sultan said. "The commercial people are looking for reliability, support and software. It's not the same as selling to an engineer who likes to sit around and tweak things."

Symmetrical designs

On a sobering note, Gordon Kerr, senior vice president of MIS at Hyatt Hotels Corp., said massively parallel systems from Pyramid and other vendors could benefit users with intensive data and image search demands, such as insurance companies, retailers or credit reporting agencies.

But he disagreed with Rieke, noting that for transaction-intensive operations such as a hotel reservation system, symmetrical designs from the likes of Pyramid, Hewlett-Packard Co. and Sequent Computer Systems, Inc. are sufficient.

"Whenever the dust settles on the latest round [of symmetrical multiprocessor introductions], they're all going to be at around 2,000 transactions per second," Kerr said.

"And I don't know of anyone, with the possible exception of Sabre, who's running 2,000 transactions per second," he added, in reference to AMR Corp.'s Sabre reservation operation.

Sultan said Pyramid should have a six- to nine-month lead on massively parallel introductions by HP and IBM.

Jones said Pyramid plans to introduce a beefier massively parallel system 12 to 18 months after it introduces Meshine.

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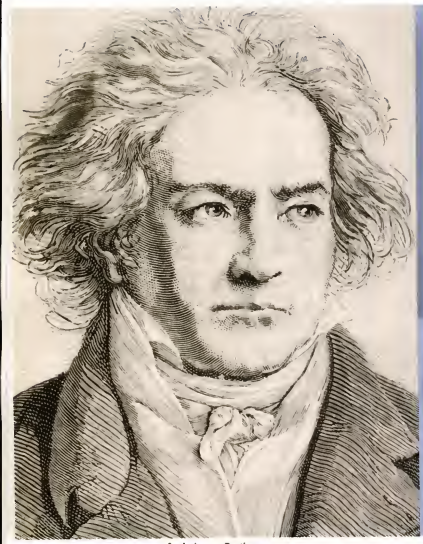
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Data repositories

CONTINUED FROM PAGE 97

That can be used as justification for expanding the effort.

Joe Illingworth, a systems planner at Eli Lilly, suggested that implementors start with a project that is at the heart of the "value-added business cycle." In the pharmaceutical industry, he said, the key is to reduce the product development cycle to get more new products out the door quickly. In other industries, he said, perhaps it is the manufacturing or order-processing cycle that is critical. "You have to find out what is important and focus on that. Work with the visionaries in your company."

All are reasons why it is important to start small. Donald Feinberg, an analyst at Gartner Group, Inc. in Stamford, Conn., said that perhaps only 20% of existing mainframe data will be accounted for in a repository. Once this data is modeled and cleaned up, all information created afterward should be available through a repository. "There is no way to retrofit all legacy data," he said.

At Kraft General Foods in Northbrook, Ill., the goal has been to provide the repository as a service to application developers, according to Ann Marie Durso, director of applications architecture. "The developers are so focused on delivering function to their business customers, they needed something that wouldn't impact their schedules," she said.

Gerald Moss, who served as the project leader of the Federal Aviation Administration's repository pilot during the past year, said technical challenges can be daunting. "A lot of things behind the scenes can sneak up on you and cause you problems," he said. "You need a good, solid technical team that knows existing technology, data modeling, the repository, and that includes functional area experts in each of the business areas."

Moss, a consultant with the Fairfax, Va., consulting firm Advanced Testing Technologies, Inc., also suggested paying particular attention to the communications infrastructure. In the FAA's case, the agency had to implement TCP/IP before it could deploy the repository it had selected.

Repository implementation requires the team to find out what kinds of data exist in various database dictionaries and computer-aided software engineering tools and what kinds of information business users or developers need. The biggest effort, and the one hardest to cost-justify, implementors said, is the data-modeling required to standardize names and other data components across the enterprise.

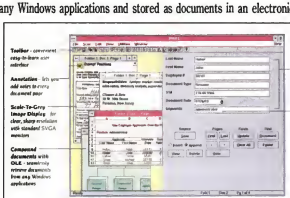
One application may ask for a customer name of 12 letters, while another requires a customer of just eight. These issues need to be rectified for all applications and data that will be included in the repository.

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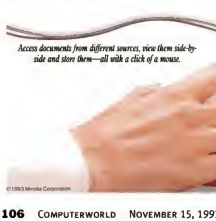


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Briefs

Utility buys System 3600

Kansas City Power & Light has purchased two **NCR Corp.** System 3600 massively parallel systems. The machines, which will replace two **Unisys Corp.** 2200 Series mainframes, will be used to maintain customer data, perform financial functions and serve as a disaster support system.

3M to sell IBM tapes

Users can now buy half-inch cartridges and related tape accessories for the IBM 3480 tape drive family through the **3M Co.** IBM has said it will no longer sell the tapes.

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New Products

Software

Compuware Corp. has introduced Abend-Aid Release 7.0, a batch fault diagnosis tool that analyzes the cause of abends.

According to the Farmington Hills, Mich., company, enhancements added to this release include extended support for IBM environments and DB2 enhancements that provide plan package support.

Other features include extended Cobol support, improved Snap-Aid functionality, enhanced table functionality, batch file utility commands, an updated output selection menu and improved user exits.

Pricing begins at $39,500.

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FlexiWare Corp. has announced the availability of IBM DB2 support for its FlexiFinancials client/server accounting software.

According to the Shelton, Conn., company, FlexiFinancials is an object-oriented, Windows-based client/server financial accounting system that was designed to address high-volume transaction-processing requirements of corporations with multinational or multidivisional sites.

PC users can access data stored on IBM mainframes, AS/400 systems and other platforms in a client/server environment.

A five-user connection costs $100,000.

▶ *FlexiWare*
(203) 925-3040

Omron Electronics, Inc. has announced several software drivers designed for IBM's Distributed Application Environment network software that allow for high-speed, transparent communications with Omron's factory automation and control networks.

According to the Schaumburg, Ill., company, the drivers allow IBM computers and factory management software, including Plantworks, Paperless Manufacturing WorkPlace and the Process Operations Management System to transparently access manufacturing information from Omron programmable controllers for easier setup and faster screen updates.

Pricing begins at $1,000.

▶ *Omron Electronics*
(708) 843-7900

Management Information Technology, Inc. has introduced WatchWorks, an intelligent database monitoring and response tool for Oracle Corp.'s relational database management systems.

According to the Long Beach, Calif., company, the product monitors one or more Oracle databases. Through user-defined actions, it alerts users to specific conditions and events such as system overload and security violations.

WatchWorks monitors user activities, thresholds or changes in data and performance.

WatchWorks pricing begins at $2,000.

▶ *Management Information Technology*
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Hardware

Deltec Electronics Corp. has announced its line of PowerRite Pro Uninterruptible Power Systems and PowerCheck Pro software for monitoring uninterruptible power supply (UPS) power across the network.

According to the San Diego company, PowerRite Pro incorporates Deltec's Advanced Battery Management, which extends the life of UPS batteries up to 10 years and alerts users up to 60 days in advance that the battery life of the UPS is fading.

The PowerRite Pro indicates site wiring faults, battery and load status, communications status, and under and over voltages. It was designed to protect LAN file servers, network nodes and workstations from power anomalies.

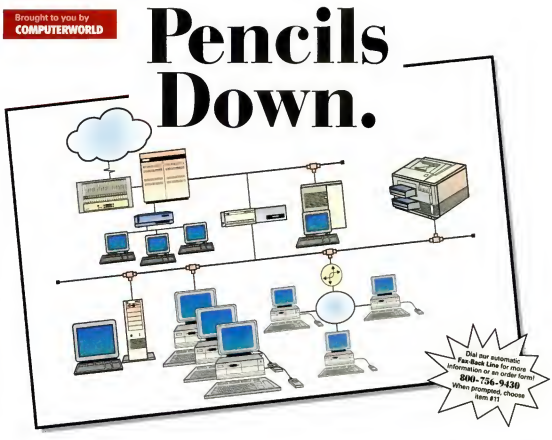
PowerCheck Pro is power-monitoring software that informs the network administrator about all of the information required to monitor the network's power.

Available in six models, PowerRite Pro prices start at $449. The optional PowerCheck software starts at $99.

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Intersolv scales for the desktop

By Melinda-Carol Ballou

Intersolv, Inc. recently announced Intersolv APS for client/server, a version of the company's fourth-generation language tools that offers Windows support, a graphical interface and a tool to allow for the rapid development of client/server applications.

Intersolv seeks to leverage its traditional strengths in accessing mainframe environments along with the current tools' ability to scale down to the desktop. APS 3.0 for Client/Server offers a feature called Automatic Client/Server Access, which allows developers to have, for example, high-performance, native access to IBM IMS or VSAM data from Windows or OS/2 clients.

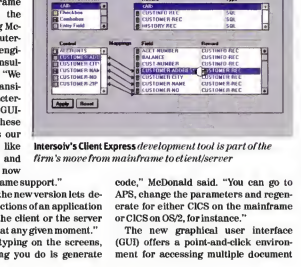
CICS everywhere

Home Savings of America, one of the largest savings and loan organizations in the U.S., is using APS to make the transition to client/server from 150 old Cobol programs and CICS on the mainframe to CICS running on OS/2.

"We're very excited about the APS tools. The learning curve is something we're very comfortable with because the mainframe terminology is the same," said Greg McDonald, computer-aided software engineering tool consultant at the bank. "We can make the transition from character-based screens to GUI-based using these tools and access our legacy data. It's like PowerBuilder and SQL Windows now [but] with mainframe support."

He added that the new version lets developers split functions of an application to target either the client or the server and to change it "at any given moment."

"You do prototyping on the screens, and the last thing you do is generate code," McDonald said. "You can go to APS, change the parameters and regenerate for either CICS on the mainframe or CICS on OS/2, for instance."



Intersolv's Client Express *development tool is part of the firm's move from mainframe to client/server*

The new graphical user interface (GUI) offers a point-and-click environment for accessing multiple document interfaces, user-configurable tool bars and floating tool palettes, as well as Client Express, a tool that lets developers create client/server applications with GUIs in a nonprocedural, visual manner, company officials said.

Positive track record

"Intersolv has demonstrated the ability to interact with mainframes and get online performance for transaction systems using mainframe data and multiple databases," said Paul Bloom, general partner at Volpe, Welty & Co., a San Francisco investment company. "Some of the other client/server tools targeting the high end have not been proven in the marketplace."

"With this release they have delivered a much richer client capability. Their challenge was to scale down rather than scale up," said Steve McClure, an analyst at International Data Corp., a Framingham, Mass., consulting firm. "They now have a tool that is a lot more graphical and exploits the Windows environment to create applications more easily but retains the access to mainframe data."

APS 3.0 for Client/Server will ship next month and is priced at $4,000 per seat for both Windows and OS/2 platforms.

Digitalk ties old apps into SQL databases

By Ed Scannell

Digitalk, Inc. has released an updated version of its OS/2-based client/server tool designed to better integrate several best-selling relational databases.

One of the biggest advantages of Version 2.0 of the Parts Relational Data Interface for OS/2 is that information systems organizations can assemble or reuse existing software from multiple technologies instead of writing components from scratch.

Using Digitalk's Parts Workbench as a framework, corporate users can create new components in several languages including Smalltalk/V, Cobol and C.

"Using our CICS and Cobol wrappers, we believe customers can integrate legacy systems with SQL database functions," said Michael Arrigo, vice president of marketing at Digitalk in Santa Ana, Calif.

Besides the support it already offers for OS/2 Database Manager, Version 2.0 of Parts has added support for more than a half dozen other client/server databases including Microsoft Corp.'s SQL Server, Oracle Corp.'s Oracle 6 and 7, IBM's DB2/2, Novell, Inc.'s NetWare SQL Database and Borland International, Inc.'s dBase III and IV.

Some of the tool's new features include a SQL library that can hold multiple SQL statements, the ability to read rows of data forward and backward and a new workbench database menu that allows developers to customize data types.

Version 2.0 also lets users put together graphical applications that work independently of a database. Those same client/server applications, however, can also work across different databases.

Shipping now, Version 2.0 carries a list price of $995. Users can distribute applications using Parts without paying a runtime royalty.

Cobol in KnowledgeWare's sights

By Melinda-Carol Ballou

KnowledgeWare, Inc. will fill out its product line next month when it begins shipping tools that allow users to redeploy legacy programs as client/server applications.

Atlanta-based KnowledgeWare's NorthStar tools will allow developers to pull out Cobol code from applications, analyze it to determine its design and then move it over to KnowledgeWare's Application Development Workbench (ADW) for redevelopment as a client/server application, sources close to the company said.

The unveiling will follow similar announcements by Texas Instruments, Inc. and IBM [CW, Oct. 18].

Developed in conjunction with Integrated Microcomputer Systems, Inc. in Rockville, Md., NorthStar acts as a stepping-stone to ADW. The product offers an interim repository where developers can perform graphical analysis of Cobol code to create flow diagrams of an application.

Using program analyzers, developers can obtain finer levels of detail about an application's design, the sources said. The program can then be moved into ADW for redeployment as a client/server application, the sources said.

KnowledgeWare declined to comment on the product.

Developers can also take advantage of other computer-aided software engineering tools, such as Intersolv, Inc.'s Excelerator and ITI's Information Engineering Facility and tools from Bachman Information Systems, Inc., Cadre Technologies, Inc., LBMS, Inc. and Popkin Software, via ADW's Rochade repository, they added.

NorthStar supplements KnowledgeWare's Legacy Workbench tools, which provide for the maintenance, redesign and migration of mainframe-based systems. Legacy Workbench offers application assessment, program documentation, program restructuring and graphical maintenance, KnowledgeWare officials said.

Gateway

KnowledgeWare offers a one-way gateway between ADW and its Flashpoint and Objectview GUI-based client/server tools. A bidirectional gateway can be expected during the first quarter of 1994. More than 4,200 companies use ADW, and KnowledgeWare has shipped more than 108,000 products, the company said.

Some users of the Legacy Workbench spoke about the advantages of the tools. "We've used Legacy Workbench for some time and have integrated the tools into the operations for our Cobol change control systems," said Fred Sauer, a systems planning specialist at a major automotive company. "[They] provide measurement of the quality of the programs each time they're updated."

Asked about the ability of NorthStar to bring legacy Cobol programs into ADW for analysis and redeployment, Sauer said, "It sounds very tempting, but I'd like to see it working first."

However, while these tools and others like them can help with the process, they are not cheap and offer no "silver bullet" for eliminating manual coding, industry analysts said. "It's far from an automated procedure," said Ed Acly, an analyst at International Data Corp., a consulting firm in Framingham, Mass. He noted that "considerable work may be required to get the application in shape."

NorthStar's pricing starts at $24,000, sources said, and the product will run under OS/2 or Windows 3.1. The Legacy Workbench is priced at $100,000 for five workstations.

Client/server enters mission-critical game

By Melinda-Carol Ballou

While some corporate information systems departments complain of bitting the wall with client/server tools, others are targeting client/server for mission-critical, transaction-intensive applications.

One such example is Fortis, Inc. in New York, the U.S. arm of Fortis International, a $46 billion international insurance and financial services company. Fortis is setting up an infrastructure for corporatewide client/server processing along with a pilot claims processing application.

Using Andersen Consulting's Foundation tools and consulting services, Fortis will develop client/server applications to link three subsidiaries in Woodbury, Minn., Kansas City, Mo., and Milwaukee (see chart).

Fortis officials said they initially opted for Andersen's consulting services and then chose its tools after evaluating other options.

Before the acquisition

The three subsidiaries were originally separate companies: Time Insurance Co., a health care organization in Milwaukee; Mutual Benefits Life Insurance, a Kansas City firm specializing in long-term disability and similar programs (now called Fortis Benefits Insurance Co.); and Western Life Insurance in Woodbury, a mutual fund and variable annuities firm (now called Fortis Financial Group).

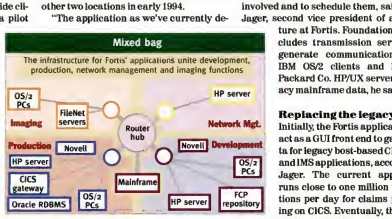
When Fortis acquired them, each had disparate hardware and software systems that had to be re-engineered to create a united, coordinated entity, said Cheri Rodolfo, senior vice president at Fortis.

The first application, which will go live in Milwaukee next month, is an imaging tool for claims processing that also incorporates data capture and analysis and work management. It will be built using Foundation for Cooperative Processing (FCP) tools and methodology, imaging software and hardware from FileNet Corp. in Costa Mesa, Calif., and Oracle Corp.'s relational database management system. The application is scheduled to go live at the other two locations in early 1994.

"The application as we've currently defined it is a medical claims application. This first phase involves setting up the infrastructure, the networks, security, software distribution methodology and development tools standards," Rodolfo said. "We've developed two utilities which will be used across our different companies. The first one is imaging and image-assisted data capture, and the second one is work management."

Fortis will be able to apply the two applications across the subsidiaries, allowing the companies to focus on their markets while working in a cohesive manner. "We want to cross-sell among the three units. We want the companies to be recognized as one in the marketplace so that if you call any one of them, they will [have easy access to the data] to recognize your relationship with all three," she said.

Fortis is using Foundation to generate client applications for Windows and graphical user interface (GUI) environments and a methodology tool to define all the tasks involved and to schedule them, said Gordy Jager, second vice president of architecture at Fortis. Foundation also includes transmission services to generate communications from IBM OS/2 clients and Hewlett-Packard Co. HP/UX servers to legacy mainframe data, he said.



Replacing the legacy

Initially, the Fortis application will act as a GUI front end to gather data for legacy host-based CICS, DB2 and IMS applications, according to Jager. The current application runs close to one million transactions per day for claims processing on CICS. Eventually, the entire application will move to client/server as the legacy code is replaced.

Fortis spent $1 million for the Foundation FCP tools, methodology and services and the 1,000-workstation, imaging-based claims system.

While tools such as Foundation are becoming more appropriate for developing mission-critical client/server systems, consulting provided by the vendor can be critical and expensive, said Curt Monash, president of Monash Information Services. "There is an up-front learning curve which cannot be evaded," Monash said.

Briefs

Ada specialists unite

Verdix Corp. in Herndon, Va., and **Rational** in Santa Clara, Calif., makers of Ada compilers and development tools, have announced plans to merge.

The combined public company, with annual sales of about $70 million, reportedly will have the largest share of the Ada market. Both companies want to expand their markets into broad commercial areas.

Technology alliance

Earlier this month, **Object Design, Inc.** and **ParcPlace Systems, Inc.** set up a technology and marketing alliance to unite Object Design's ObjectStore object-oriented database with ParcPlace's Smalltalk.

When available, the combined products will allow developers to create applications with complex data requirements to manage interactive multimedia and financial time-series information, for instance, according to officials from both companies.

An early-access beta program is scheduled for the second quarter of next year.

Commentary

Scott H. Koehler

Object illusions



Say "object-oriented" and some people see dancing cubes and spheres. Others have a variety of misconceptions.

These flawed notions result from a combination of media misinformation, vendor hype and attempts to fit object orientation within existing frames of reference, such as modern structured analysis or data normalization techniques. Some misconceptions are the following:

▶ **All visual development tools are object-oriented.** There is a hot debate around the issue of what constitutes object orientation — support for inheritance, polymorphism, encapsulation, etc. I subscribe to purist "think." I do not believe that tools such as PowerBuilder and Visual Basic are true object-oriented environments. I'm in the camp that calls them "object-based."

Based, oriented — what does it matter? Just semantics, right? As long as the tool delivers the necessary functionality, who cares if it handles polymorphism or if the business logic is coded in a procedural-based language?

It matters in that users of these tools will not receive or understand the benefits of full object orientation. The experiences of those users will cloud information reported by early adopters of pure object-oriented technology, and many people will remain confused.

▶ **The hard part is mastering the programming language.** Many firms are focusing on training developers in C++ and expecting object implementations to follow. The reality is that in object-oriented development, analysis and design are critical. If you get the design wrong — that is, pick the wrong objects — your implementation will be impaired and most likely will not be object-oriented.

▶ **Objects are packaged procedures/subroutines.** People often commingle object concepts and procedural-based thinking. It's not uncommon to hear objects described as verbs, for example, a print object or calculation object. However, objects are generally nouns, and the verbs represent methods or processes that are part of the object. For instance, a Form will know how to print itself, or an Insurance Policy will know how to calculate its premium.

▶ **Object orientation emphasizes process over data.** Some see the object approach as a return to the days when process was king. Actually, it is "thing" centric. An object represents an abstract data type that models some real-world thing and presents a unified model that encourages a tighter coupling of process and data than we've seen before.

▶ **Object-oriented technology is synonymous with GUIs.** Many people feel that object-oriented technology is used only to build GUIs, and all GUIs must be built using object-oriented technology. Neither, of course, is true. Object-oriented technology excels at implementing GUIs but is not mandatory. Object technology is well-suited for a host of non-GUI business applications, particularly those that model complex, dynamic domains.

▶ **Stored procedures are an example of object orientation.** Stored procedures provide a method of embedding process, along with the data, in a relational database. There is no object orientation to this approach since the stored procedure can update whatever it wants.

▶ **Class hierarchies are a method of providing functional decomposition;** they **describe whole/part relationships.** Neither is true. A class hierarchy establishes a network where specialized classes inherit behavior from more generalized classes. This is a powerful way of sharing attributes and behaviors, and therefore, code. There is no corollary from structured design to use as a frame of reference.

▶ **Object-oriented means Object Linking and Embedding (OLE). Microsoft's OLE 2.0 specification facilitates linking various PC-based applications such as spreadsheets and word processors. Applications are called "objects." Object-oriented programming is not required.**

▶ **Object-oriented programming requires the use of an object-oriented database.** Not so. Many techniques for object storage are possible, including relational databases.

Koehler is a principal at Koehler Consulting in Holliston, Mass.



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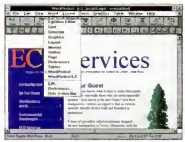
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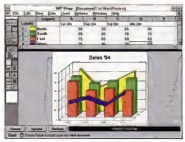
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DataServer Analyzer tackles complex queries

By Kim S. Nash

CEO: So tell me, Mr. Analyst, how many circular saws did our hardware division sell in Louisville after running a 20% off coupon in local papers in April, and how does that compare with sales after the giveaway radio spot in Buffalo all summer?

Analyst: Uh, I'm not sure, Ma'am. We have to wait for the quarterly reports at the end of December because my query tool can't get the relational database to give me that kind of data.

CEO: But IS just told me we spent several million dollars converting flat-file systems to relational to give us those answers.

Fade to black.

Relational database management systems, with their strict rows and columns of data, cannot facilitate the intricate, multifaceted requests that financial and marketing analysts — never mind chief executive officers — like to make.

At least according to IRI Software, formerly known as Information Resources, Inc. IRI provides a data warehouse and tool set that sits between inquisitive PC end users and RDBMSs, such as Oracle Corp.'s Oracle, Sybase, Inc.'s SQL Server, IBM's DB2 or Digital Equipment Corp.'s Rdb.

The Waltham, Mass., company recently unveiled a sales and marketing analysis product set designed to reshape corporate data into a form akin to the complex queries decision-support workers pose. DataServer Analyzer comprises Windows-based tools such as a report writer and query makers. A proprietary database built on IRI's Express scripting language stores information culled from corporate databases. But it does not use SQL, the preferred access method of relational products.

DataServer Analyzer's Express language lets users look at raw data in ways that are impossible with SQL, claimed Jeff Stamen, president of IRI. SQL was created to get at data stored neatly on a two-dimensional X/Y axis. IRI's database stores information multidimensionally, Stamen said.

US West sees IRI's products as a way to maintain — and in some cases enhance — decision-support tasks as the company moves some applications from a central host to a Unix client/server environment. Express tools "open new insight into data" on mainframe and desktop platforms, said Tom Keeney, director of financial information systems.

Because marketing professionals can subdivide, rearrange and juxtapose raw data in new ways, they can ask different questions. The process can turn up markets "they couldn't see before," said Gary Langstaff, president of TPM Resources, a marketing service firm specializing in retail and franchises.

IRI tools are better suited for decision support than products from Oracle or Sybase because IRI built the products for that sole purpose, Stamen said. RDBMSs, he said, are better at what they were created for: transaction processing.

Red Brick Systems in Los Gatos, Calif., makes a similar argument for keeping specialized decision-support DBMSs separate from transaction processing systems. In theory, dedicated decision-support databases give users quicker access and the ability to perform more useful queries. Traditional RDBMSs can bog down or misinterpret questions such as, "What if we offered a discount to friends of customers who have bought products in the past year using personal checks or cash?"

DataServer Analyzer is the first in a series of vertical market-oriented tools expected from IRI. A financial analyzer is due out by Christmas, Stamen said. The products support Microsoft Corp.'s Open Database Connectivity, the Open Software Foundation's Distributed Computing Environment and other links to third-party products.

The client portion of DataServer Analyzer, which requires 8M bytes of memory, is priced at $3,750. The database piece, which can sit on a mainframe, minicomputer or Unix server, starts at $25,000.

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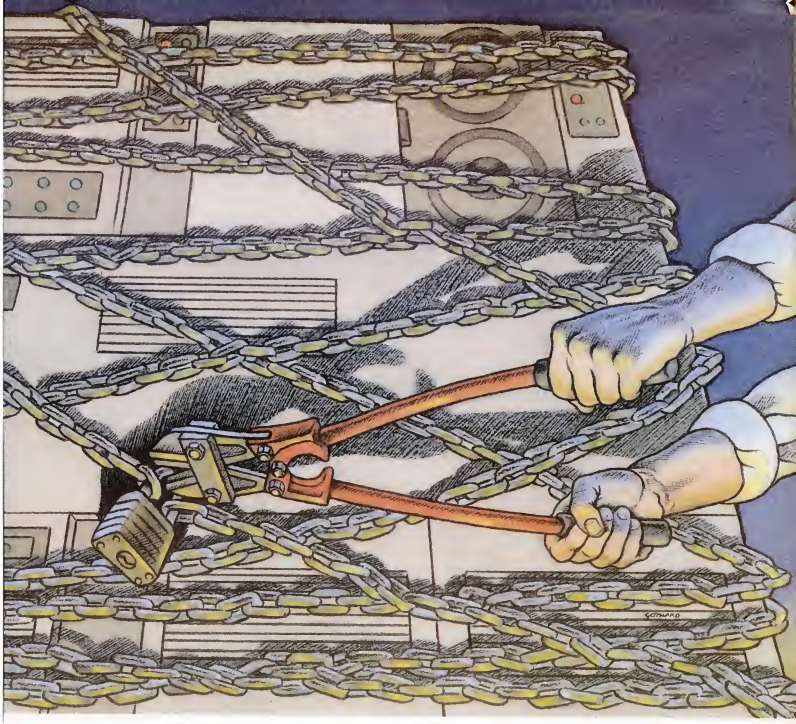
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Small integrators play to current advantage

By Ellis Booker

Small systems integrators are winning their fair share of business, particularly on the client/server integration and development front, where new technology smarts, not price, is the calling card.

These so-called boutiques — with revenue in the $50 million range — operate in the shadow of top integrators Andersen Consulting, IBM and Computer Sciences Corp. Those three owned 44% of the industry's $21.8 billion in revenue last year, according to Para-Technology, Inc., a market research and consulting firm in Bellevue, Wash.

Systems integrators

Para-Technology figures also indicated that an increasing number of new systems integration contracts last year were awarded in the $50,000 to $250,000 range, rather than the $500,000 to $5 million range, effectively lowering the entry barrier for small firms.

Indeed, if smaller systems integrators have an edge, it is due to their ability to focus on projects with relatively smaller staffs and finish projects faster, analysts said. "The big guys take 30 days to put together a team and put 50 people on the project, and [they] take 12 to 18 months to finish it," said Peter Raulerson, Para-Technology's president. "The little guys can complete the project in 30 days."

Many of these smaller firms are ahead of the larger companies when it comes to expertise in new technologies, particularly client/server computing. "They have been able to offer what the big guys had to play catch-up in," said Bonnie Digrius, an analyst at Gartner Group, Inc. in Stamford, Conn.

On the other hand, Digrius said she believes the client/server emphasis is not a long-term strategy. Companies such as Electronic Data Systems Corp. and Andersen Consulting have made no secret of their plan to ramp up a client/server capability. "Within a year, these boutigues have to be on the next phase of technology or go out of business or he acquired," she said.

"We have a two-year window to grab market share [with client/server]," agreed Mark Shirman, who left Andersen Consulting in 1985 to form Innovative Information Systems, Inc., an integrator in Norwood, Mass. Today the privately held company does between $50 million and $75 million annually, Shirman said, most of it on client/server jobs.

Still, Shirman and other small-company executives pointed out that their head start will serve them well in the future; besides, they say, there will be "abundant" work and clients for the foreseeable future.

"If it's a fair game...we can win [against larger integrators]. We've won against them already," said Mark Tebbe, president of Lante Corp., a Chicago firm founded in 1984.

Like Shirman, Tebbe is an Andersen Consulting alumnus who left the firm in the mid-1980s to, as he put it, "leverage the corporate investment in microcomputers beyond making the PC a terminal emulation device."

Tebbe also disputed the assumption that small firms win accounts because of low prices. The Bank Administration Institute, a trade association in Chicago and a recent Lante customer, backed up Tebbe. "They were 50% more expensive than Digital," said Clint Swift, director of MIS. Swift used Lante to develop a strategy for deploying a graphical development environment for his IBM AS/400.



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– *Chevron Canada*

"Our client, TRW, found that getting information for project planning was simply too slow."
– *NetBase Corporation*

"Teachers were spending more time on reports than on teaching."
– *National Computer Systems*

"We had multiple systems from two companies, all with different looks, all taking data and processing it in a different way."
– *Chemical Bank's Geoserve® Group*

"Despite automation, drafting was still a paper intensive process."
– *Aetna Life and Casualty*

"There was no easy way to get critical ticketing information to the PCs on agents' desks."
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More and more companies are solving their business-critical problems with Microsoft® products and expert advice from its partners. Here are a few solutions:

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Chevron Canada was in a crisis fueled by a 20-year-old system.

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Chevron formed a task force of technical staff and end users. They developed a client-server system that used Microsoft products like the Visual Basic® programming system, SQL Server, LAN Manager, and the Windows NT™ operating system.

These days, accurate pricing information on 300 products can be accessed online by 200 users. Price and tax adjustments can be handled many times faster, and paper-handling costs have been cut in half.

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Aerospace giant TRW approached NetBase, a Microsoft Solution Provider, to help it manage its projects more efficiently. The problem: Getting project data from the mainframes was expensive and slow.

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The education division of National Computer Systems (NCS®) had been handed a classroom problem: In public school systems around the country, teachers were still managing reports by hand, and losing instruction time.

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PowerStation 16, and FoxPro.

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Aetna produced up to 6,000 booklets a year, each outlining a benefits plan for a different corporate customer. The problem: They used dead-end text processing and document management systems to do it.

The solution was an integrated document management system built around Microsoft Visual C++ and Word for Windows®, plus a front end created with Microsoft Visual Basic.

As a result, Aetna has cut the time required to draft new booklets by more than 115 hours a week, while improving the final product.

"Agents can grab data, work with it, and use it to give customers better service."

In 1992, Air France's ticketing data was in a holding pattern, stuck inside a proprietary database that ran on mid-range equipment.

The airline, in partnership with MediaServ, a Microsoft Solution Provider, rightsized to a system with Windows NT, SQL Server for Windows NT, Visual Basic, Visual C++, and Microsoft Access.

Now agents can get data easily, and even analyze it on their own. What's more, the system can now be passively maintained by one person, instead of a full-time team of five.

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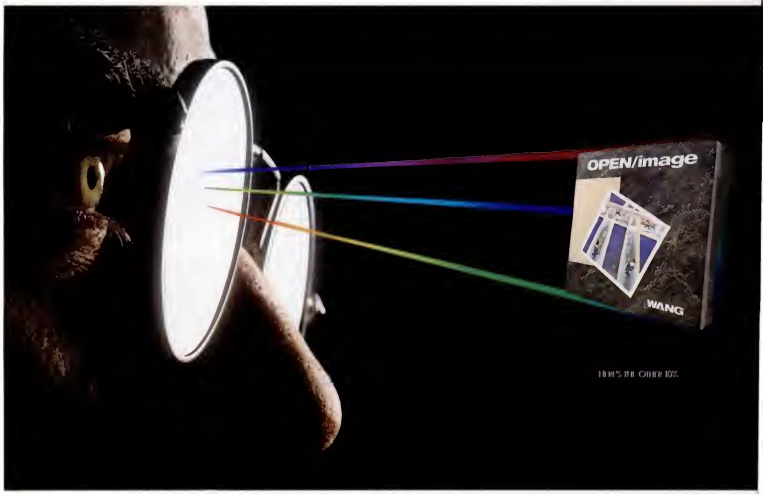
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New Products

Togal InfraLogic, Inc. has announced TILShell 3.0, a fuzzy logic software development tool.

According to the Irvine, Calif., company, TILShell 3.0 is a robust, full-feature graphical computer-aided software engineering tool that supports all design steps for engineering environments.

TILShell 3.0 features real-time on-line debugging and tuning of fuzzy rules, membership functions and rule weights; advanced fuzzy inference methods; fully integrated graphical simulation of fuzzy systems; three-dimensional color rule base and operator visualization and tuning tools; a variable editor for defining system data; and a membership function editor for defining membership function variables.

Prices start at $795.

▶ *Togal InfraLogic (714) 588-3800*

AimTech Corp. has introduced IconAuthor 5.0 for Motif, an upgrade to its Unix-based multimedia authoring tool.

According to the Nashua, N.H., company, this version features its SmartObject Editor as well as technology that is equivalent to functionality in IconAuthor 5.0 for Windows.

IconAuthor 5.0 for Motif offers an object-oriented editor for creating content pages, including standard Motif objects such as list boxes, buttons, navigational screens, lesson pages and tests that allow the user to create all of their screens and copy and paste or drag and drop between pages.

IconAuthor 5.0 for Motif costs $10,000 for a single user; $30,000 for a four-user license and $60,000 for a 10-user license.

▶ *AimTech (603) 883-0220*

XVT Software, Inc. has announced XVT Development Solution for C (XVT-DS) and XVT Development Solution for C++ (XVT-DS++).

According to the Boulder, Colo., company, XVT-DS repackages releases of the company's software that emphasize visual layout and prototyping of portable graphical user interfaces for fast, easy development of "industrial strength" cross-platform applications in C.

XVT-DS++ unites XVT-Power++ with the XVT Portability Tool kit, creating an advanced framework for the development of portable applications that use C++ object-oriented programming.

The XVT-DS and XVT-DS++ cost $1,950 on PCs and Macintoshes and $6,300 on workstations.

▶ *XVT Software (303) 443-4223*

Blue Sky Software Corp. has announced that the WindowsMaker Professional 5, Prototyper and C/C++ Code Generator for Windows and Microsoft Corp.'s Windows NT now also generates code for Borland International, Inc.'s ObjectWindows Library (OWL) 2.0.

According to the La Jolla, Calif., company, WindowsMaker features include the ability to create Windows applications, edit during Preview Mode, switch to any language or major C++ library during the development of an application, add functionality directly behind objects and provide fast code generation.

Other features such as full tool bar support, application templates and an extendable open architecture are also provided.

The OWL 2.0 application programming interface shows how to take advantage of object-oriented programming.

WindowsMaker Professional 5 costs $995.

▶ *Blue Sky Software (619) 459-6365*

Cincom Systems, Inc. has announced XpertRule Version 2.1, a Windows-based knowledge specification and application-generation system.

According to the Cincinnati company, Version 2.1 provides enhanced graphical knowledge capabilities, refined source-code generators and forms-based end-user facilities.

Users can develop, prototype and refine applications needed for complex decision processes.

The product automates knowledge capture by employing learning-by-example techniques and graphically displays the information as truth tables, pattern rules and decision and exception trees.

XpertRule Version 2.1 costs $990.

▶ *Cincom Systems (513) 662-2300*

Avid Technology, Inc. has introduced the Open Media Framework (OMF) Interchange Toolkit, a software package that adds support for OMF Interchange to any digital audio, graphics, video or animation application.

According to the Tewksbury, Mass., company, OMF Interchange is a standard file format that encapsulates the information needed to transport an assortment of digital media between applications and across heterogeneous platforms.

The Open Media Framework Interchange ToolKit costs $499.

▶ *Avid Technology (508) 640-6789*

Geoworks has introduced the Geos 2.0 software development kit, an all-inclusive set of application tools and documentation on CD-ROM.

According to the Berkeley, Calif., company, the product runs in a cross-development environment, making it possible for developers to create a single application for multiple computing devices.

Users can create custom debugging commands with Swat, the Geos debugger. Other features include a Linker and a Resource Editor.

The product costs $99.

▶ *Geoworks (510) 644-0883*

Applied Business Technology Corp. (ABT) has announced Methods Architect Version 1.0.

According to the New York company, the product is a Windows-based program that allows information systems organizations to customize and automate their chosen development methodologies regardless of whether they are proprietary.

When the product is used with the company's Project Bridge Modeler, customers can plan and estimate a project before sending it to be scheduled, tracked and analyzed in ABT's interactive project planning, control and decision support system, Project Workbench.

Prices range from $1,875 to $25,000.

▶ *Applied Business Technology (212) 219-894*

Product shorts

Evergreen Technologies, Inc. has announced VisionTools, a set of scientific imaging and visualization tools for the Visual Basic programming environment. Designed for high-end scientific imaging applications, VisionTools facilitates rapid prototyping and development of complex solutions in a productive programming environment. Cost: $495. Evergreen Technologies, Castine, Maine (207) 326-8300.... **Application Development Consultants, Inc.** has introduced CASEwise Modeler, an intuitive modeling tool for business analysts and software engineers. Version 3.0 provides more than 200 enhancements with two additional fully integrated Matrix Modeling and DataFlow Diagrams modules. Cost: $3,750. Application Development Consultants, Tampa, Fla. (813) 265-3706.... **Visible Systems Corp.** has announced Version 5.2 of the Visible Analyst Workbench computer-aided software engineering tool. Features include SQL Dynamic Data Link generation enhancements, Gupta Corp.'s SQL Windows interface, PowerSoft Corp.'s PowerBuilder interface, entity/attributes displayed on data models, an extensible repository and the generation of structure charts from the repository. Cost: $1,895 to $4,995. Visible Systems, Waltham, Mass. (617) 890-2273.... **Information Engineering Systems Corp.** has announced IDE: Advisor Version 2.0, which fully documents the business-driven Information Engineering methodology and runs under Windows 3.1. The product consists of a hypermedia software-based reference product and a comprehensive set of methodology/application/assimilation manuals. Cost: $75,000 for a site license. Information Engineering Systems, Alexandria, Va. (703) 739-2242.... **Ipsys Software** has introduced Object Information Engineering Version 2.1. The product is an implementation of the Information Engineering method and was designed to speed up the development and maintenance of large client/server projects. Cost: $100,000 for five users. Ipsys Software, Newbury, Mass. (508) 463-0006.

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* Class Members System
* Resource Management System
* Planning System

The software must be proven and operate in either Digital VAX/VMS or VAX/UNIX "Open Systems" environment.

Tender documents are available from John Negus 61-2-950 1619 or 61-2-950 1600 (FAX) on payment of a $200 non-refundable fee.

Responses should be lodged in the Tender Box, Level 3, Information Systems Division, NSW TAFE Commission, 39A Herbert St, St. Leonards, NSW 2065, Australia by 2.00 pm local time on 11 January, 1994.

Trapped In The Body Of This Tiny Se

This is a story about a small computer engineered to be so dependable, you won't think twice about trusting it with your mission-critical applications. And to be this without filling a closet,



much less a room. If you haven't thought of Compaq as an enterprise-critical platform before, we invite you to grab your bifocals and begin. (We'll be cramming a lot of information into this ad, which, given how much we managed to fit into our new servers, only makes sense.)

If there's one thing we've learned working with our customers, it's that you're running more and more mission-critical applications on your network. And if your network goes down, your business goes down. All of which makes the introduction of the new Compaq ProLiant Server even more timely.

The ProLiant is a new family of affordable, high-performance, easy-to-manage servers engineered specifically to provide the high availability you need for mission-critical networks. We've designed ProLiant in three different models, ranging from a single-processor configuration to a four-Pentium processor model.

Now, how can you be sure our server is truly a



miracle and not a mirage? To begin with, there's Full Spectrum Fault Management, provided by Compaq Insight Manager technology and software that continually monitors over 800 aspects of the server's operating status. (For example, Drive Parameter Tracking checks 15 hard-drive parameters.) All of this information is constantly gathered, analyzed and then used to prevent, tolerate or recover from system problems.

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Still, no network's perfect. In the unlikely event problems occur, our server exhibits remarkable tolerance. Every ProLiant includes Compaq-designed hot-pluggable drives. ProLiant Models 2000 and 4000 come standard with advanced error-correcting memory and off-line backup processor features (whereby the server reboots automatically to a second processor). And, most notably, the Compaq Smart SCSI Array Controller together with the ProLiant Storage System ensures mission-critical data integrity. Should a network problem bring the server down, the Rapid Recovery Systems of the ProLiant are designed to bring it back up.

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*And finally, to accompany our new line of mission-critical servers, we're introducing mission-critical support. With ProLiant, we now offer extensive analysis, installation and service through our CompaqCare System Partners, a select group of highly trained systems experts backed by Compaq engineers. You can now choose 4-hour on-site warranty response upgrade** direct from Compaq. Again, there's our unique Pre-Failure Warranty. And, of course, all Compaq servers come with a 3-year on-site[1] warranty, and 7-day-a-week, 24-hour-a-day technical support.*



All in a surprisingly small box for not a whole lot of money. In fact, a DX2/66 Compaq ProLiant 1000 starts at about $6000[2].

Which may help to explain the look your boss gives you when he hears how much money you've saved: stunned admiration. But you'll get used to that. It goes with the territory. For more information on the new Compaq ProLiant servers, or for the location of an authorized Compaq reseller near you, just call us at 1-800-345-1518. If you'd like to receive model, feature and specification information immediately via fax, select the PaqFax option. Or, if you'd like that information even sooner, just turn the page.



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Storage Capacity	550MB–112GB Internal/external	1050MB–140GB Internal/external	1050MB–140GB Internal/external
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Transaction Rating	50–150 TPS	200–300 TPS	300–400 TPS
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Management	Second-generation Compaq Insight Manager (standard) combines with innovative hardware design to constantly monitor, assess and report server health and performance		
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System Warranty	Free Three-Year, On-Site Limited Warranty		
Pre-Failure Warranty	Three-Year, On-Site Warranty replacement of designated components that fall below preestablished thresholds		
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Technical Support	Toll-free, 7 x 24 technical phone support from Compaq engineers		
CompaqCare System Partners	Highly trained, dedicated, third-party professionals who provide systems maintenance and comprehensive technical support		
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The IS business manager/account executive position has taken off among the Fortune 100. But the question still lingers . . .

Whose side are you on?

BY WILLIE SCHATZ

The Benedict Arnold of information systems — that was how Howard Piggee was made to feel after he became IS business manager at Corning, Inc.'s Scientific Products Division in Corning, N.Y. But to him, it was simply a matter of putting the business first.

In his previous life, Piggee worked in the corporate IS center at the glass products company. Part of his job description was to provide the company's 15 business divisions with the best technology at the most competitive prices. But, he says, he felt he didn't have enough control over his job, so when the opportunity to become an IS business manager arose, he immediately seized it.

As IS business manager, Piggee would have the chance to work on the cutting edge of IS organizational practice by serving as the intermediary between IS and other functions.

Taking the post required a new attitude: "Readjusting your mental set is the most difficult thing for a person coming into this position," Piggee says. "You can't be totally focused anymore on being an IS techie. You can't have the same mental set as you had in centralized IS."

While Piggee grasped that concept from day one, his former IS peers apparently still don't get it. Piggee's most trying times occur when centralized IS believes it has gotten the shaft from one of its own.

With the new IS business manager model, central IS no longer deals directly with the business unit customers, as it had become accustomed to doing. The central information technology unit saw Piggee as a traitor — a former member of the organization who had become an obstacle. The word went out that Piggee was not a cooperator; it took intervention from senior management to crush the opposition.

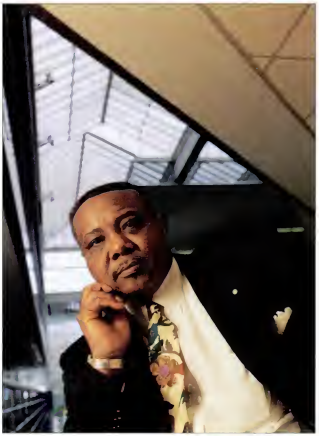
Since then, the territorialism has significantly decreased, Piggee says. Still, he finds it very difficult to stay in sync with two sometimes hostile groups that want all of his time.

Also known as IS account executives, IS business managers are midlevel managers appointed to serve as intermediaries between IS and other functions or between IS and various business units. They can act as facilitators and enhance communication. Sometimes, they are the end users' advocate to the IS organization.

Gaining appeal

The business manager concept is becoming more popular because of the pressure on IS organizations to better serve their internal clientele. Three years ago, not more than six of the 84 members of the Research Board, Inc., a New York-based consultancy of chief information officers from companies with $10 billion in annual revenue, were interested in the concept. Now the trend is sweeping across all Research Board companies, although some have implemented the concept more fully than others, says Executive Director Ernest von Simson. Syracuse University's School of Information

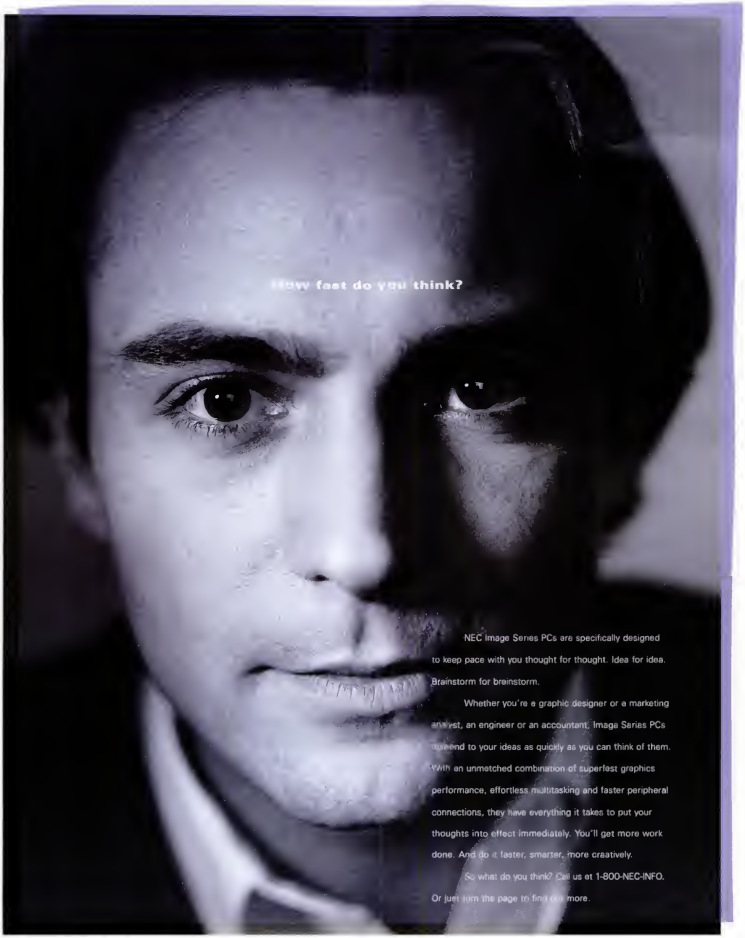
Whose side?, *page 133*



Bill Pierce/Sygma

Howard Piggee's *former IS peers at Corning saw him as a traitor*


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NEC

Whose side?

CONTINUED FROM PAGE 129

Studies is now training IS graduates to serve in this position (see box below).

Much of the pressure to create the IS business manager position came from users. "Senior managers in our biggest financial service and manufacturing companies are telling IS they want them to take the lead in creating a partnership between centralized IS and the company's business units," von Simson says.

The skills and personality required to become a successful IS business manager are the antithesis of those associated with the stereotypical techie, according to von Simson. IS business manager hybrids are extroverted, curious about the business and more willing to take risks than your average IS professional. They must be practiced in the art of interpersonal relationships and willing to work literally side by side with their non-IS clients.

"Our members are really combining the IS units and the business units into teams so they are subject to a common set of metrics, objectives and physical space to get a common job done," von Simson says. "This is a totally different environment than either IS people or business unit people are used to."

> *"The whole IS business manager concept is about how the hell you run an IS department in the '90s. Everyone knows IS organizations have to transform themselves, but no one's figured out the right way."*
>
> *Cheryl Currid*
> *Currid & Co.*

Managers without a country

When they first appeared, IS business managers were treated as pariahs.

"These folks used to be like people without a country," says Cheryl Currid, who for eight years functioned as an IS account executive while serving as director of applied information at Houston-based Coke Foods.

"They weren't part of IS any more, and they weren't part of the business units they were supposed to serve. They were half-breeds who had to speak two different languages and be intergalactic translators," says Currid, who is now president of Currid & Co., an IS consulting firm in Houston.

Even today, they still find they can't serve two masters. They must serve one side or the other, Currid says.

At Corning, it's clear that the business side is the Siggee serves.

"I'm a buyer of our centralized IS services," Piggee says. He still feels the old connection with Corning's IS organization: If his division needs information services, and the competition between an internal or external IS service provider is close, "I'll stay with our services."

"But the decision is always made on overall value to the business needs of my division. I can't be so short-sighted as to focus something solely on IS that's not beneficial to the entire organization. I understand the bottom line of where we're going because that's what pays us," Piggee says.

A house divided

At Tenneco Gas in Houston, the issue of serving two masters was addressed through a team approach.

Tenneco started using IS end-user intermediaries when federal regulations forced it to re-engineer its billing process. A cross-disciplinary 15-person "brain trust" of vice presidents and directors, including Roger Berry, Tenneco Gas' vice president of IS, oversaw the implementation of the project. A 50-person force of IS and non-IS personnel carried out the down-and-dirty trench warfare.

"Communication between my IS staff and the end users before the re-engineering was OK, but it wasn't focused enough," Berry admits.

Team approach

The team approach allowed the company to focus on key user issues and coordinate testing procedures. The end result allowed it to migrate from an IBM-based system to a Sequent Computer Systems, Inc.-based system within its target timetable of a year.

Whether organizations decide to assign an individual business manager to individual departments as Corning has done or follow the team approach used by Tenneco Gas, IS business managers will be crucial to running the IS department of the 1990s.

"The whole IS business manager concept is about how the hell you run an IS department in the '90s," Currid contends. "Everyone knows that IS organizations have to transform themselves, but no one's figured out the right way." IS business managers are likely to be crucial to finding the answer. ■

Schatz is a free-lance writer in Washington.

SYRACUSE UNIVERSITY TRAINS IS BUSINESS MANAGERS

You know the subject of IS business managers has to be deadly serious when the academic community rewards it with sheepskin.

"Business analysts are the prototypical bridge between a company's information systems operation and its business units," says Don Marchand, dean of the School of Information Studies (IST) at Syracuse University in Syracuse, N.Y.

"We specifically train our students to be business analysts so they leave here with an already integrated awareness of the business world and the information technology world."

IST GRADS AND UNDERGRADS HIT THE BOOKS IN FOUR MAIN AREAS:

- **Management of IS and technology in a business environment context.**
- **The organization of information and its use and added value.**
- **The application of information technology in terms of the coming convergence of computers, communications and telecommunications.**
- **Customer/user focus to understand how people use information technology.**

The program mixes these intense academic pursuits with a variety of corporate cooperative programs that, Marchand says, give students a chance to focus on their career path before they escape the academic ivory tower.

IST grads have been hired by such industry giants as J. P. Morgan, Merck & Co., Digital Equipment Corp., General Electric Co. and Andersen Consulting and government agencies such as the Federal Aviation Administration.

– *Willie Schatz*

THE EVOLUTION OF THE IS BUSINESS MANAGER

Ernest von Simson, executive director of the Research Board, says the growing trend of combining IS units and business units into teams is the third phase of managing the often fractious relationship between the two groups.

1 **In the first phase,** business unit members led the peacemaking efforts with the IS sector. But the companies discovered, often too late, that much of what these facilitators did further complicated the relationship between the two. Von Simson says they proposed application enhancements that were redundant and unnecessary, hopelessly backlogging both departments.

2 **In the second phase,** the IS department appointed members of their own staff to serve as account executives. They helped the business units navigate the often troubled waters of IS solutions in order to get the biggest bang for their limited bucks.

3 **The third phase** sees the two groups working by a common set of metrics and objectives and in a common physical space to get the job done. The job of the IS business manager, once ridiculed and scorned throughout the company, is now among the most prized in the corporate hierarchy.

> ***"Most people see being an IS business manager as a successful step up on the career ladder," says Harvey Shrednick, senior vice president of information services at Corning, Inc., the Corning, N.Y., glass products company. "Their image and credibility have both increased significantly."***

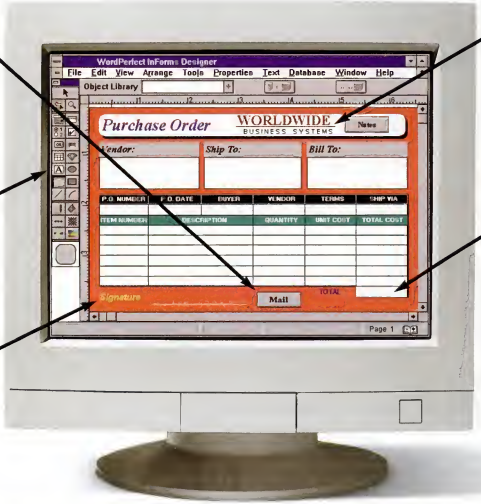
Where is the IS account executive/business manager position likely to head? According to von Simson, "The next generation will knit together [information technology] and the business units into solutions which cross the entire organization. That concept will be driven by two things: the need for the corporation to present a single face to the customer and the notion of reusability, such as object-oriented technology."

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Benchmarking resources grow for IS managers

IS managers wanting to develop a formal benchmarking program can take advantage of a wide array of resources

BY LESLIE GOFF

Gary Pollard has found partners in his benchmarking program from what at first glance might seem like unusual sources. After all, what do airline reservation systems have to do with manufacturing printed circuit boards?

More than one might think, according to Pollard, who found that one of the beauties of information systems benchmarking is that you can learn from a company in a different line of business. Because the technologies from one company to the next are basically the same, the challenges are similar, says Pollard, who is the total quality director of IS and services at Texas Instruments, Inc. in Dallas.

Making comparisons

Arising largely from the total quality management (TQM) movement, process benchmarking involves comparing the internal IS processes of one company with those of other companies. The goal is to identify and borrow from the best practices of exemplary IS organizations.

Numerical benchmarking has been the traditional process used to evaluate an IS system's performance efficiency, such as how quickly in MIPS the system is operating or how quickly disk drives are accessing information.

Process benchmarking, on the other hand, measures how efficient the IS process is in general.

IS managers who want to develop a formal benchmarking program can take advantage of a wide array of resources from IS consortia, professional associations, consulting firms and benchmark vendors. Costs range from $7,500 to $100,000, depending on the services required (see chart below).

In less structured (and less costly) efforts, companies can also turn to user group roundtables, professional association meetings, networking with colleagues and trade literature, according to Doug Brockway, a principal at Nolan, Norton & Co. in Boston.

Running the gamut

The array of available benchmarking services covers everything from training and education to consensus modeling of goals and expectations, facilitation of partnerships and multiclient study groups. The latter has become an increasingly visible benchmarking tool employed by many organizations.

These study groups choose a limited number of topics to explore one by one and meet regularly over the course of a

Benchmarking, *page 141*

TO BE SUCCESSFUL WITH PROCESS BENCHMARKING, IS MANAGERS SHOULD BE SURE TO:

- **Determine the specific areas of IS to be investigated, such as data center management, how to construct an information technology strategy that is connected to the business strategy or whether an IS head count is appropriate.**
- **Define consensus models of the problems to be addressed by the group members.**
- **Find and approach potential partner companies with which to share information.**
- **Develop appropriate and ethical questionnaires. (Never ask a colleague a question you wouldn't answer yourself.)**
- **Analyze the data gathered to apply to changing existing processes.**
- **Conduct surveys and field visits to compare processes.**

WHERE TO FIND PROCESS BENCHMARKING SERVICES

COMPANY	CONTACT	SERVICES OFFERED	CLIENT REQUIREMENTS	FEES
IS consortia/professional associations				
Chicago Research and Planning Group, 421 N. Northwest Hwy., Suite 201, Barrington, Ill. 60010	Richard Arra, executive director, (708) 381-8128	Assists companies in linking with appropriate benchmarking partners; sponsors study groups to explore areas of mutual interest.	Must be a CRPG member; members must be CIOs or equivalent.	$2,500/year for preferred members (about 25% of membership; preferred members help set CRPG's overall direction); $800/year for members at large.
International Benchmarking Clearinghouse, American Product and Quality Center, 123 N. Post Oak Lane, Houston, Texas 77024	Lisa Higgins, manager of member development, (713) 935-4754	Provides training and education; facilitates benchmark partnering; maintains database of past benchmarking studies and best practices; sponsors common interest groups; publishes benchmarking guidelines.	Must be a member of the Clearinghouse.	Initiation fee ranging from $1,000 to $12,500. Annual fee is $6,000/year/designated participant.
Omicron, 115 Route 46, Suite D-31, Mountain Lakes, N.J. 07046	Jim Webber, president and executive director, (201) 335-0240	Benchmarking Support Resources program, including benchmarking task forces; benchmarking field visits; field survey support.	Company must be an Omicron member.	$8,500/year and up for services subscribed to by the member; $10,000 to $12,000 for benchmarking task forces.
Society for Information Management International, 401 N. Michigan Ave., Chicago, Ill. 60611-4267	Lisa Paulsen, chapter programs coordinator, (312) 644-6610, ext. 5771	Sponsors working groups for members with mutual interests; members meet on an ongoing basis to share information about their organizations; current working groups, located around the country, are focusing on client/server computing, IS process architecture and information technology procurement.	Must be a SIM member to participate in working groups.	$1,200/year (academic) or $2,000/year (corporate) for institutional membership; $125/year (academic) or $250/year (corporate) for individual membership.
Consulting firms				
EDI Group Ltd. and Price Waterhouse, 221 Lake St., Oak Park, Ill. 60302	Ruth Ochmig-Lindroth, director of sales and customer service, (708) 848-0135	Sponsors multiclient benchmarking projects that collect and analyze such data as the business uses of EDI, quantitative measures of EDI activity, staffing and costs of EDI activity, and flow-charting of processes and discussion of the application of EDI to business processes.	Must be involved in a high level of EDI implementation.	$7,500/year/participant payable upon signing the benchmarking project agreement.
Ernst & Young Center for Information Technology and Strategy, 1 Walnut St., Boston, Mass. 02108	Richard Swanborg, principal, (617) 725-1517	Sponsors the IS Leadership Program consisting of 18 companies focusing on information technology management issues and the identification of leading practices. Areas of interest: retraining IS professionals, managing information technology value and accelerating the systems delivery process.	Member companies must be involved in applying TQM techniques.	$25,000/year/company.
IBM Consulting Group 44 S. Broadway White Plains, N.Y. 10601	Sharon Seidell, program manager, bus. dev. (914) 288-5575	Benchmark training and education; facilitation of multiclient groups focused on specific topics of mutual interest.	None	Depends on service chosen; $10,000 to $100,000 for participation in multiclient groups.
Nolan, Norton & Co. 1 Boston Place Boston, Mass. 02108	John P. Halloran, managing partner, U.S. operations, (617) 723-8800	Sponsors multiclient study groups on topics of mutual interest, including end-user computing, information technology architecture, telecommunications and data center management.	Not available	$10,000-$50,000 for participation in multiclient studies; fees for benchmarking consulting depend on scope of the project.
Towers Perrins, 200 W. Madison St., Suite 3400, Chicago, Ill. 60606	Jeffrey A. Thompson managing consultant, (312) 606-9419	Conducts Data Processing Quality Benchmarking Survey (in the process of soliciting institutions to participate in the 1994 study).	Not available	Cost is $15,000-$20,000 per company.
Xerox Quality Solutions P.O. Box 20425 Rochester, N.Y. 14602-9988	Customer information line, (800) 699-0701	Benchmark consulting, training and facilitation, including assistance in determining appropriate partners and working with benchmarking partners, as part of its total quality management services for external clients.	Should be committed to implementing TQM techniques.	$333 to $433/student/day for training courses.
Benchmark vendors				
Compaq America, Inc., 1020 Isaac Newton Square, Reston, Va. 22090	John Thomas, vice president of marketing, (703) 708-7800	Facilitates formation of reference groups consisting of five to six companies each to compare operations in data centers.	Must appoint a project coordinator.	$30,000 to $100,000 or more, depending on volume and complexity of assignment.
Real Decisions Corp. 22 Thorndal Circle Darien, Conn. 06820	Thomas Berg, communications manager, (203) 656-1500	Provides clients with access to benchmark databases; assists information technology managers in evaluating performance using proprietary methodologies; conjectures best practices groups involving multiple clients wishing to focus on a specific area of information technology management.	Must be a member of Real Decisions' Decision Support Center.	$7,500/company/year and up to participate in best practices group, depending on chosen area of study.



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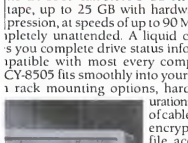
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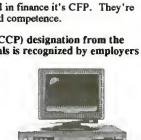
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Benchmarking

CONTINUED FROM PAGE 136

year or more, either in person or via teleconferencing. Member firms also arrange field visits among themselves.

"The whole phenomenon of multiclient groups is noteworthy," says Janet Caldow, a senior consultant at the IBM Consulting Group in White Plains, N.Y., who is heading up such a group to examine business culture and its relationship to IS. "Information technology is so state of the art that you can't take a university course, since those are behind, and you don't get enough depth from a single two- or three-day conference."

The Society for Information Management (SIM) International, for example, sponsors working groups of members with mutual interests that study information technology issues as they relate to TQM.

"We look at everything from the quality viewpoint — how do quality procedures affect the output of the IS organization, and how does [information technology] improve the overall quality of the entire enterprise? We wanted to come up with a knowledge base to help people understand TQM in IS and also put out a deliverable," notes Frances Craig, chairman of the Working Group Committee of Volunteers for SIM and president of Computing Strategies, Inc., a Vienna, Va.-based systems integration firm.

Most multiclient groups include senior or executive management only, but benchmarkers agree that the participation of lower management and staff is integral to the success of any good process benchmarking effort.

Pursuit of excellence

"It's an overused term, but your [firm] has to have a top-down commitment to pursue excellence," says Don Perez, manager of change and problem management for voice and data services at USAA, a financial services firm in San Antonio.

USAA and Real Decisions Corp. in Darien, Conn., are co-sponsoring a best practices group investigating data center management. "If it does [have the commitment], then best practices benchmarking is a steppingstone in that direction," Perez says.

So whether employing large-scale or less formal benchmarking techniques, IS organizations "can learn whether their preconceived notions are valid," Brockway says. "They can study the decisions of different companies and evaluate whether other processes would work better in their own organizations."

Companies are using process benchmarking to explore such IS issues as developing an information technology strategy connected to the business, reducing systems development cycle times, building the information technology infrastructure, distributing software in a client/server environment and end-user computing.

"We wanted to evaluate IS performance at a strategic level, not just measure our data center," says Maryann Holloway, planning specialist at Du Pont Information Systems in Wilmington, Del. The Du Pont Co. division is conducting two simultaneous benchmarking efforts.

Holloway is a member of Ernst & Young's IS Leadership Program. Sponsored by Ernst & Young's Center for Information Technology and Strategy in Boston, the group consists of 18 firms implementing TQM.

Holloway also heads a strategic benchmarking program for Du Pont's 21 business units and a number of external partners. Together, they are tackling nine specific IS issues, such as the experience and skills of the IS organization, IS financial management and budgeting and how to evaluate re-engineering projects.

But Rick Swanborg, a principal at the Center for Information Technology and Strategy, warns IS managers not to expect miraculous improvements in every function of their IS department.

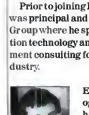
"For benchmarking to be successful, there has to be a certain amount of expectation management. Some organizations set their standards so high that they're looking for 10 improvements in one process. That rarely exists," Swanborg says.

Goff is a free-lance writer in New York.

Executive Track

Jeffrey Tarte has joined **Ernst & Young** as a partner in the New York firm's health care information technology practice. Tarte will assume a national role in the firm's advanced clinical systems and systems integration practice.

Prior to joining Ernst & Young, Tarte was principal and co-founder of The Core Group where he specialized in information technology and operations management consulting for the health care industry.



Enterprise Technology Corp. in New York has named **Joseph Rosen** to the position of managing director. Rosen's responsibilities will involve all aspects of the development, organization and management of the company's consulting and software development business in the investment management and securities trading sectors. He will report to Kevin J. Merz, managing director and chief executive officer.

Prior to joining ETC, Rosen was chief information officer at Dubin & Swieca Capital Management and was a founding partner of the financial technology consultancy Rosen Kupperman Associates.

The **Chicago Board of Trade** has announced the appointment of **Mike Boyle** to the position of vice president of planning and implementation for the information systems department. He will report to Donald Karmazin, vice president of information systems.

Boyle has been an employee of the Chicago Board of Trade since 1974. Prior to his appointment, he was director of floor support systems. He also serves as chairman of the Inter-Exchange Technical Committee.



Cognos, Inc., which maintains dual headquarters in Burlington, Mass., and Ottawa, has named Neal Hill vice president of corporate marketing. Prior to joining Cognos, Hill was a senior analyst in the Computing Strategy Service at Forrester Research, Inc.

Forrester Research, Inc. in Cambridge, Mass., has announced that **Mary Modahl** has joined its Computer Strategy Service as an analyst. Modahl was formerly director of Forrester's Network Strategy Service.

Bob Shaw, vice president of management information systems at **Atlantic Records** in New York, has been promoted to senior vice president of MIS.

Gail D. Fosler, vice president and chief economist at **The Conference Board** in New York, has been elected to Unisys Corp.'s board of directors.

Warren Ferriter has been named senior vice president, systems and technology, at the publishing unit of **Paramount Communications, Inc.** in New York. He succeeds John Diesem, who left the company. Ferriter was previously senior vice president and chief information officer at Paramount Pictures.

Laurent Levy has been promoted to group manager, network services, at **Omicron Consulting** in Philadelphia. He reports to Valerie DeRusso, director of network services. Levy joined Omicron as a senior systems analyst. Prior to that he was a senior systems engineer at the Robbinsville, N.J., office of Inacom.

Intelligence Files

CIO pay scales soar . . .

Chief information officers had good reason to smile this year: Their annual compensation continued to grow at nearly twice the rate for white-collar professionals in general.

The average total annual compensation (salary plus yearly bonus) for CIOs reached $172,000 this year, a 10% increase from the year before, according to the 1993 Information Systems Compensation Survey released by William M. Mercer, Inc. in New York.

Average annual compensation for CIOs in 1992 was $155,500, which also bad grown by 10% from the preceding year. In contrast, compensation growth for white-collar professionals in general showed a 4.6% increase this year.

. . . but IS staffs shrink

The same survey also showed some bad news for CIOs this year: Most of them will have to get by with smaller staffs. That won't be quite so hard to take for some CIOs, however. The same survey found that of the 1,000 corporations contacted, 16% are downsizing information systems functions. Also, 14% of the total companies surveyed are now considering outsourcing some or all of their computer support services. This number has doubled from the year before.

Other findings in the survey include the fact that 46% of the companies now offer flex time to their IS employees, and 65% now require their IS employees to be on call during nonwork hours, either by phone or beeper. Most firms requiring this did not provide extra call-in pay or compensatory time off in lieu of such pay.

Source: 1993 Information Systems Compensation Survey, William M. Mercer, Inc., New York.

Getting global vision

Companies wanting to develop global vision and take advantage of significant profit and growth potential from overseas markets should focus on six strategic steps. These six steps are discussed in detail in a new study, "Global vision: Building new models for the corporation of the future," by John L. Daniels and N. Caroline Daniels.

The book is intended to be a blueprint for companies that wish to enter the global marketplace. It looks at the experiences of companies that have already gone global, discusses the pitfalls they encountered and advises managers on how to avoid false starts and wasted time. The book is based on a five-year study by IBM and KPMG Peat Marwick.

Source: "Global vision: Building new models for the corporation of the future," John L. Daniels and N. Caroline Daniels (McGraw-Hill, $27.95).

Work-flow explosion

The average chief information officer is now involved in 4.4 business re-engineering projects at any one time, up from 1.6 a year ago. That is the finding of a recent survey of more than 500 CIOs by Deloitte & Touche's Information Technology Consulting Services in Wilton, Conn. The survey also notes that CIOs are reporting mixed results on their re-engineering efforts, but the demand for re-engineering software is still expected to skyrocket.

Source: Deloitte & Touche, Wilton, Conn.

Research service launched

CSC Index, Inc., a Cambridge, Mass., unit of Computer Sciences Corp. (CSC), will introduce a new research service called CSC Genesis that will examine leading developments in business strategy, process management, organizational change and corporate culture in the information technology community.

Source: CSC Index, Inc., Cambridge, Mass.

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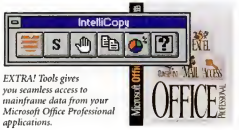
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The CW Guide to Next-Generation PCs



CHIP SHOTS

A STRUGGLE FOR LEADERSHIP IS CHANGING THE FACE OF PCs. HERE'S HOW THESE CHANGES AFFECT YOU.

IN THIS SECTION

COMPUTERWORLD BUYERS' SATISFACTION SCORECARD

Dell's OptiPlex scores highest of 486-based PCs in 12 of 17 categories rated by users. *Page 174.*

FIRING LINE

Evaluators say NCR's System 3000 workstations and servers, with dual Pentium processors, are screamers. *Page 177.*

BY GEORGE THOMPSON

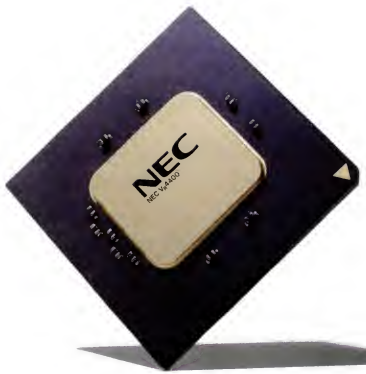
Don't look now, but the next generation of PCs is here. More than 100 Pentium-based PCs will be unleashed at Comdex/Fall '93, and the first systems using the new RISC CPUs are now available. So for anyone assessing the cost/benefit of PC LAN or client/server environments, it's time to reconsider the implications of these new PCs in the next three to five years.

It may be three years or so before Intel Corp. feels the real heat from RISC competitors, most notably the Motorola, Inc./IBM/Apple Computer, Inc. PowerPC effort. According to senior analyst Chris Goodhue at Gartner Group, Inc. in Stamford, Conn., it will be more like five years before enough software will run on each of the leading CPUs. At that point, he says, "you'll be able to go to Egghead and get Excel 4.0 for an x86-based PC or for a [Mips Technologies, Inc.] R4400."

Despite all the attention that will undoubtedly be lavished on the price/performance equation, software really is the key issue here. On that count, it's hard to argue with Intel's Pentium, which can now run more than 60,000 software applications.

However, there is more to software than DOS/Windows compatibility. Desktop systems using recently developed RISC CPUs such as Digital Equipment Corp.'s Alpha AXP, the PowerPC 601 and Mips' R4x00 take advantage of newer 32-bit operating systems. The PowerPC chip is expected to support a native Windows NT for PowerPC, as will the Alpha AXP and R4x00.

From a desktop perspective, Macintosh applications may be the key for the PowerPC. The fact is, the new chips are really just groundwork for a future that can take any number of routes.



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The reason Microsoft chose the MIPS RISC architecture is simple—raw, unadulterated speed. In fact, NEC's V_R4400 runs Windows NT almost twice as fast as Pentium,™ and nearly four times as fast as the 486™ DX2/66.*

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If you're responsible for evaluating new PCs running Windows NT, look for the new V_R4400-based systems. They run faster, save you money and even let you use your existing DOS and Windows 3.1 applications.

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NUTS, BOLTS AND CHIPS

The grand plan is still under construction in the PC arena, but some facts have been hammered out. George Thompson, technical editor at Cardinal Business Media, spoke with three analysts to address some of the more tangible issues and get responses to users' most common questions.

How will existing software applications fare, running on Pentium?

A Pentium systems can run all 16-bit DOS and Windows applications natively. But to take full advantage of the chip's architecture, the applications have to be recompiled.

Software code compiled with the best 486 compiler will run about 15% slower than code compiled for the Pentium, according to Frank Spindler, Pentium's product marketing manager. Existing x86 code will run about 30% slower. Once recompiled, however, those same applications will run incrementally faster on a 486 as well.

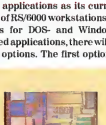
The typical PC user who does not buy new recompiled software and uses very little floating-point calculations will see a 30% to 80% performance increase over a 66-MHz 486DX2-based system.

With RISC- or Pentium-based systems running Microsoft Corp.'s Windows NT, existing 16-bit software will run in emulation, courtesy of an NT application programming interface (API). New applications written for each CPU instruction set will run natively via other NT APIs. These latter APIs make it easier for developers to write programs that will run under Windows NT, the current Windows 3.1 and the forthcoming Chicago (which will probably be known as Windows 4.0).

What software is expected to run directly on the PowerPC?

A Currently, no PC software has been compiled for the PowerPC. But it is expected in the future to run 80% to 90% of today's Macintosh software. Additionally, IBM's recently introduced PowerStations, using the PowerPC 601 chip, run the same IBM AIX applications as its current line of RS/6000 workstations.

As for DOS- and Windows-based applications, there will be two options. The first option is to run them unmodified using a technology called the Windows Application Binary Open Interface (WABI) developed by Sun Microsystems, Inc.



Pentium

- Offers integer performance advantages over current 486-based systems by at least a factor of two (at the same clock speed).
- Can execute more than one instruction simultaneously.
- Completely redesigned floating-point unit.
- Performance at 66-MHz clock speed:
  - 64.5 SPECint92 (integer)
  - 56.9 SPECfp92 (floating point)
- Power requirement: 16 watts.
- 32-bit address bus and 64-bit data bus.
- On-chip cache: two 8K-byte caches, one for instructions and one for data.
- Operating systems:
  - Windows/DOS – available now.
  - Windows NT – available now.
  - OS/2 – available now.
  - SCO Unix, Solaris – available now.
- For portables: A second Pentium version with lower power requirements is on the way.
- Cost: $965 each for a quantity of 1,000.

The second option is to run them under native Windows NT, but in order to do this, the applications would have to be recompiled.

The PowerPC will also run applications written for the PowerOpen Application Binary Interface. A Unix-variant derived from AIX, the PowerOpen Environment will conform to industry standards such as Posix, X/Open's XPG and the Open Software Foundation's Motif.

How will PowerPC performance be affected when it runs Windows applications under emulation software?

A Actual results remain to be seen, but WABI-added applications are expected to take performance hits of as much as 50%. Still, many expect the performance to be acceptable, and in any rate, it should be faster than a 486 DX2.

IBM is also working on a hardware-aided emulation strategy for the more straightforward instructions. The hardware actually "suggests" the correct corresponding PowerPC instruction to emulate the CISC instruction. However, there is no telling when that technology will be available.

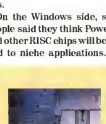
Will a PowerPC system hook into installed PC LANs running NetWare, LAN Manager or common network operating systems?

A That depends on the kinds of drivers and protocols available for the operating environment you're working in. Networking capabilities are not an advantage for either the Pentium or PowerOpen CPUs.

What software will be most important for PowerPC's success?

A The key will be for Apple to drastically open the availability of the Macintosh operating system. More so than PowerOpen or AIX, System 7 has the mass appeal to vault the chip into a major position. But they will have to get to 20% or 30% market share to do that. That means opening the system to third parties.

On the Windows side, some people said they think PowerPC and other RISC chips will be limited to niche applications. For example, spreadsheet power users might benefit from a RISC/Windows combination, which could be much, much faster than a traditional x86-based PC. In application areas where execution speed is not critical, RISC/Windows may not be the best solution.



PowerPC 601

- RISC architecture.
- Can execute more than one instruction simultaneously.
- Performance at 66-MHz clock speed:
  - 60 SPECint92 (integer)
  - 81 SPECfp92 (floating point)
- Power requirement: 8 watts.
- 32-bit address bus and 64-bit data bus.
- On-chip cache: A single 32K-byte cache for instructions and data.
- Operating systems:
  - Windows/DOS – emulation through Wabi or Windows NT.
  - Windows NT – native expected for first half of 1994.
  - System 7 – native planned for first half of 1994.
  - AIX available now; Solaris is planned.
- For portables: A PowerPC chip specifically for portable computing, the 603, is scheduled for availability in early 1994.
- Cost: $450 each purchased in a quantity of 1,000.

When Pentium systems first appeared, there were some reports of overheating. Is that still a problem?

A Although early versions of Pentium-based systems were criticized for their heat problems, most of the heat issues have been resolved. Intel expects to solve all of its thermal problems with the next version of the chip. But when it speeds up the internal clock of that chip, the problem may get out of hand again.

What is the relative cost of RISC and Pentium systems?

A IBM's current PowerPC workstation is drastically more expensive than Pentium PCs, by two to three times, depending on the configuration. But because of the large number of system vendors using Pentium CPUs, the cost varies widely.

For example, while a Gateway 2000, Inc. 60-MHz Pentium with a display costs $2,995, a similarly configured Pentium-based system from IBM costs $4,699. By comparison, IBM's PowerPC 601-based PowerStations range from $5,445 to $9,395. Digital's new DECpc Alpha AXP 150, which uses a 150-MHz Alpha CPU and includes Windows NT, is $6,795. A similar Digital 60-MHz Pentium-based PC, the DECpc 560ST with Windows NT, costs $7,613.

Pricing for the next generation of Macintosh systems, built around the PowerPC, remains to be seen. If Apple is smart, it will undercut Pentium system prices by 20% or more.

Intel continues to push the performance of the 486, with 486

Next generation, *page 146*

The Next-Generation PC

VIDEO

Because the XT/AT buses cannot keep up with the video output of today's CPUs, video performance can be a bottleneck under graphical environments such as Windows. Local bus video has already become a fairly common solution. Local bus bumps video output up to 32 bits bandwidth and 33-MHz bus speed. The standard XT/AT bus could only handle 16 bits at 8 MHz.

The de facto local bus standard to date has been the Video Electronics Standards Association (VESA) local bus, also called the VL bus. That may be replaced by the Intel-backed Peripheral Component Interconect (PCI) standard, which is just rolling off the drawing boards. Last month IBM and AST Research announced systems with the PCI local bus integrated onto the motherboard.

The VESA and PCI standards groups are both working on 64-bit implementations. Whichever standard prevails, users can expect fast video performance in next-generation PCs.

STORAGE

Watch for hard disk capacities to continue to rise. A standard-size hard disk, such as Quantum's newest Empire drives, can already accommodate well over 2G bytes of data with fast seek times and data transfer rates of more than 5M byte/sec. That will enable applications such as playing video clips from the hard disk.

Advances are also being made in optical storage, which historically has been limited by slow data access times. As optical drive makers such as Pinnacle Micro cut down access times, optical storage solutions are becoming more practical.



ADD-IN CARDS

Watch for Plug-and-Play, a new set of specifications that could eliminate, or at least curtail, the requisite software configuration and meddling with dip switches every time a new card is plugged in. When the add-ins, operating system and BIOS all support Plug-and-Play specifications, the user can simply drop in the card and start using it; the PC will detect the card or device and update the BIOS itself. For existing systems, the cards will not be quite that simple, but they should still help ease the PC add-in process.

Plug-and-Play is being supported by many key vendors – including Intel, Microsoft, Compaq, Gateway 2000 and Phoenix Technologies. Operating system support is expected in the next version of Windows. Not all of the specifications have been delivered, but with so much clout behind it, Plug-and-Play should be here to stay.

INTEGRATED MOTHERBOARD FEATURES

Many functions previously handled by peripherals and add-in cards are being integrated onto the motherboard, including disk drive controllers, graphics accelerators and networking support.

Building these functions into the PC makes them easier for the and user; it also frees up more ports and expansion slots.

Fax/data modem capabilities in many next-generation systems will be handled by integrated digital signal processor (DSP) chips. DSPs will also make PC voice synthesis more common and could replace add-in sound cards.

CONTINUED FROM PAGE 145

DX3 chips in the works. How fast will the DX 3 be, and will it cut into Pentium demand?

First of all, it probably won't affect Pentium demand because the Pentium market is still developing. It takes several years for CPU markets to mature. Pentium volume probably won't surpass 486 volume until 1996.

The DX3 chip should be slightly slower than the current Pentium processor, but not by much. Of course, future Pentium chips will have higher clock speeds as well. Intel will continue to push 486 performance forward while the Pentium market picks up momentum. Otherwise, Intel would be leaving the door open for its x86 clone competitors.

The PowerPC (being smaller and cooler) seems like a better chip for portables. Is this true, and will there be Pentium portables at all?

Although the PowerPC 601 was designed primarily for use in desktop PCs, Tadpole Technologies, Inc. has demonstrated a PowerPC 601-based notebook due to be released next year. Another PowerPC CPU, the PowerPC 603, will be specifically designed for low-cost desktops and notebook computers.

Pentium portables are possible, too, although not in the chip's current implementation. Pentium portables may use a 32-bit version of Pentium, called the P24T, that has lower power requirements. That version may not be available before the middle of next year, however. Portable batteries would not last long running the current Pentium chip.

Looking further down the road, is the x86 line a dead end? After the P6, some people believe that Intel will stop upgrading its x86-compatible processor line.

Intel is on record as being committed to the x86-based architecture through the year 2000, which means that at least the next two generations of Intel CPUs — the P6 and P7 — will likely offer backward compatibility. Keep in mind that compatibility with the x86 architecture has been one of Intel's strongest marketing gambits.

If the PowerPC is successful Intel may go a different route. But if it fails, Intel will own the market for a long time.

The following analysts contributed to this discussion: Christopher Goodhue, senior analyst at the personal computing service division of Gartner Group, Inc. in Stamford, Conn.; Dean McCarron, an analyst at Micro Design Resources in Scottsdale, Ariz., and Kimball Brown, vice president of wireless computer systems at Computer Intelligence/InfoCorp in Santa Clara, Calif.

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Commentary

Derek Slater

Patience pays

Your 16-year-old daughter walks into the house and announces that she's engaged to her 17-year-old boyfriend.

He seems like a nice enough fellow, you say, somehow maintaining your cool. But you dare to suggest that she might spare herself some rocky times if the nuptials come after they are a little more mature. After they've both seen a few more of the options.

Well, the same principle applies if you are about to commit to a high-end PC system. Buying now is throwing money away. Stop drooling over those Pentium marketing brochures for a minute and consider the benefits of waiting, say, a year. You will have more choices and a lot lower cost in 12 months. That's always true to some degree with PCs, but now it's more true than ever because of the IBM/Motorola/Apple PowerPC and Windows NT.



First off, PCs based on the PowerPC should be a viable option for many companies. Even if it has to run a trillion installed Windows applications under Apple's System 7 and emulation software (the PowerOpen plan) or under bulky NT, PowerPC is a performance threat to Pentium.

Right now, the viable chip choices are expanding by the day as operating system vendors announce ports to new platforms. For example, IBM recently caved in and announced native NT for the PowerPC, due in the first half of next year. Compaq also inked an interesting agreement with Microsoft to develop PC hardware that is tied closely to the operating system, a la Apple.

You may want to let some of these things shake out before plunking down your cash.

Whether or not you want NT can have a big effect on whether you have any incentive to leave Intel, because NT is the most likely way to get RISC performance and still run Windows applications. NT is pretty bloated right now. However, it is a major undertaking still in its first release. NT, like your daughter's boyfriend, could turn into a better prospect as it grows older. That's a wait-and-see issue.

It's also conceivable that NT and PowerPC may help ease some of the integration issues users are now facing. NT is going to be ported to the SPARC platform. Eventually that may facilitate integration of your Sun workstations with PC LANs. PowerPC may also provide a long-awaited bridge for consolidating Macintoshes and IBM-compatibles.

Use your cents

As for the money, it's true that you could wait forever for some optimal price/performance ratio. No matter when you buy PCs, you'll kick yourself when you see the price six months later. But the emergence of the PowerPC means Pentium prices are going to fall off a cliff. Not everyone believes that, but if Intel is unclear on the fate of market-leading computer systems that refuse to take notice of cheaper, faster alternatives, they are invited to consider the mainframe as a case study.

IBM plus Apple plus Motorola equals a lot of marketing clout, and you can bet that Intel is going to take action to squash PowerPC. Cyrix is also planning what it touts as a cheaper, faster x86-compatible processor called the M1. A war of words isn't going to be enough for Intel. Significant price cuts are inevitable. This is a bad thing for Intel but a good thing if you are a user planning to shell out for 1,000 desktop PCs and 50 servers.

So if you have to put new PCs on users' desks right now, hedge your bets and buy 486s. They're cheap — you can get 66-MHz DX2 models for less than $2,000 — and that should buy you some time while Pentium prices fall, PowerPC matures, and operating system issues shake out. ■

Slater is *Computerworld*'s assistant editor, features.

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What the new chips mean to you

The marketing machines are in overdrive for Intel and the PowerPC troika. The IS community's appetite for increased PC power is indeed high. However, IS managers express caution when asked about their immediate plans for the new chips, due in part to the premium price tags.

The only way we would consider these machines is if Lotus 1-2-3 ever gets to the point where it requires Pentium. Otherwise we have to ask ourselves: Is a three-tenths-of-a-second response instead of a two-second response really worth it?

However, if we decide to go on to Novell, Inc. NetWare 4.0, everything might change. We might need the extra horsepower.
Harold Sample, data processing manager, Amerada Hess Corp., Jackson, Miss.

If the Pentium truly offered twice as much computing power and I could buy it, it would have significant impact. With the way it stands now, we'd see a marginal power increase, 20% or 30%. It's not enough to make dramatic changes.
Sheldon Laube, national director, information technology, Price Waterhouse, Menlo Park, Calif.


Sheldon Laube

We're certainly going to look for the horsepower of Pentium, as we're now getting into imaging and compound documents. Multimedia is hot for us, as is CD-ROM. But we're not interested in third-party Pentium machines; we'll wait for the big guys to start shipping.
John Houlihan, PC consultant, Super Shops, Inc., San Bernadino, Calif.

PowerPC has a lot of hurdles. It certainly competes with other engineering workstations, but on the desktop, against Intel, that's a tough hurdle.
David Evans, vice president and director, JC Penney Co., Dallas

We're interested, and we need [more power] now. But it's not like we've "gotta have it," and we're not going to make a stupid move.
Scott Salter, LAN manager, JBL Professional, Northridge, Calif.

I'm sure we'll be purchasing Pentium machines specifically for the graphics in our marketing department. But we will have to evaluate the price/power ratio to make sure they're worthwhile.
Eric Baughman, PC consultant, Corometrics Medical Systems, Inc., Wallingford, Conn.


George Brenner

We're not going to change just because the Pentium and PowerPC are available. We'll change as the application software evolves to make use of these facilities. Portability is the buzzword in 1994 in our organization, so that's where we're spending more of our time.
George Brenner, director, corporate information services, MCA, inc., Universal City, Calif.

We're getting some RS/6000s with the PowerPC chip, but the chip itself had no bearing on the decision to purchase them. It didn't matter whether they were PowerPC or Pentium. The RS/6000s will serve as an entry device for imaging. We actually store the images on our AS/400 for faster access time.
John Robinson, director of data processing, county of Walla Walla, Wash.



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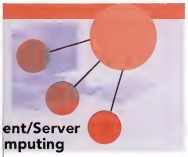
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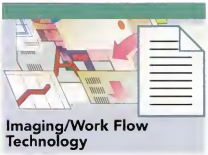
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COMPUTERWORLD BUYERS' SATISFACTION SCORECARD

Dell's OptiPlex scores high in value for the dollar, overall user satisfaction

By Kevin Burden

PC vendors take note: Your customers expect high price volatility in the PC market and seldom jump at attractive sale prices. Even users of today's high-end multiuser systems can be considered price-sensitive. But more than a great deal, these users expect value.

At press time, Dell Computer Corp.'s OptiPlex line, led by the 66-MHz DX/2, was priced at $3,749. At that price, the OptiPlex is not considered to be a clone-killer or low-priced by today's PC standards. But the feature-laden, high-powered multiuser system scored the highest value-for-the-dollar rating, proving users do not mind paying a premium when they believe it is worth it.

The survey measured user satisfaction with the Top 4 market share leaders in PC hardware. These include three systems running Intel Corp.'s 1486 processor at 66 MHz and the Apple Computer, Inc. Quadra 800 running Motorola, Inc.'s 68040 processor at 33 MHz.

The OptiPlex achieved the highest scores in 12 of the 17 categories, including eight areas rated "most important" to all of the 191 users surveyed.

Apple's Quadra garnered the highest ratings in three categories and Compaq Computer Corp. topped two. IBM posted competitive scores but did not rank at the top of any category.

Dell's strengths are in its expansion options and processing performance. But users were dissatisfied with DeskPro/M's warranty length.

Apple scored its highest marks for graphics performance and multimedia capabilities. Its warranty period was also cited as too short.

Compaq users like the DeskPro/M's processing performance and awarded it the top score for keyboard layout.

IBM's PS/2 scored high for its hard-disk performance and bundled software.

The Compaq and IBM systems received their lowest scores for price.

Service and support policies

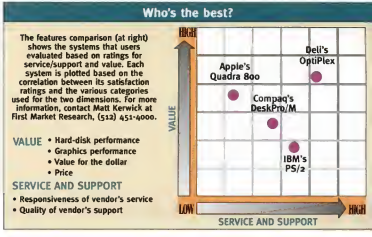
With products that offer similar features, vendors use service and support to differentiate their systems. Dell's newly enhanced support offering helped it achieve the highest rating in the service-related categories — vendor responsiveness and technical support quality.

In addition to standard around-the-clock phone support and a one-year, next-day parts and labor service offering, Dell provides users with the option of a customized program, allowing them to choose the level of service they need.

Compaq also received high service marks for its CompaqCare program, which includes lifetime phone support and a RemotePaq. This offering lets technical support engineers remotely troubleshoot your system. Compaq also provides a three-year limited warranty, the longest of the competing systems.

OptiPlex's upgradability achieved the highest score of the four PCs. Like its Intel-based brethren, the OptiPlex can be expanded to the Pentium through a P24T socket. Its chassis allows access to the system's processor board by turning a single screw. It also includes five XT/AT bus slots and five drive bays compared with only four slots and four bays for Compaq's DeskPro/M and IBM's PS/2.

Although Quadra's upgradability was rated below that of the other systems, users gave it high ratings for its expansion options. Quadra's hard disk can be expanded up to 1G byte, but the system's performance can only be enhanced by interleaving the memory.



Dell's OptiPlex

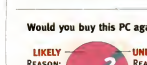
TOTAL SCORE 74

RESPONSE BASE: 51 USERS
DELL'S MARKET SHARE: 6.3%

8.1	Processing performance
7.9	Value for the dollar
7.9	Price
7.9	Responsiveness of vendor service
7.8	Quality of vendor support
7.6	Hard-disk performance

RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

Would you buy this PC again?



Compaq's DeskPro/M

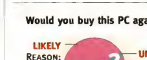
TOTAL SCORE 70

RESPONSE BASE: 53 USERS
COMPAQ'S MARKET SHARE: 8%

7.8	Processing performance
7.4	High-disk performance
7.1	Quality of vendor support
7.1	Value for the dollar
7.0	Responsiveness of vendor service
6.5	Price

RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

Would you buy this PC again?



Apple's Quadra 800

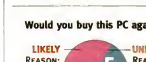
TOTAL SCORE 66

RESPONSE BASE: 37 USERS
APPLE'S MARKET SHARE: 12.3%

7.1	Processing performance
7.1	Hard-disk performance
6.4	Value for the dollar
6.3	Responsiveness of vendor service
6.0	Quality of vendor support
5.6	Price

RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

Would you buy this PC again?



IBM's PS/2

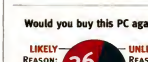
TOTAL SCORE 64

RESPONSE BASE: 50 USERS
IBM'S MARKET SHARE: 12.9%

8.1	Processing performance
7.9	Value for the dollar
7.9	Price
7.9	Responsiveness of vendor service
7.8	Quality of vendor support
7.6	Hard-disk performance

RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

Would you buy this PC again?





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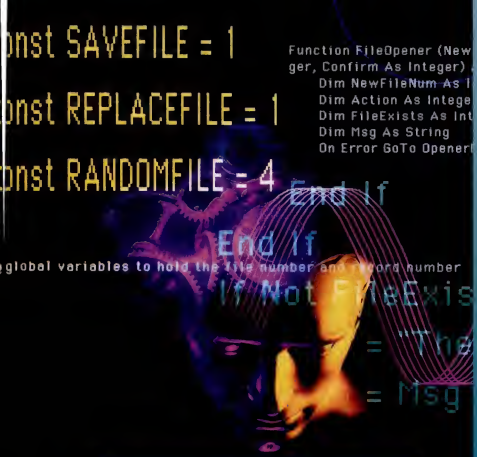
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NCR 3000 Pentium systems: Strong performance and support

System 3000

Computerworld's Firing Line is an evaluation based on interviews with major users at corporate and educational installations. The product under evaluation is being used in live application environments.

■ Evaluators rated NCR Corp.'s System 3000 Pentium machines as average or better in all categories and raved about NCR's technical support staff. They agreed that the systems provide extraordinary performance as both workstations and file servers.

Participating in this evaluation were three users of the NCR 3360 workstation, a $20,000 (approximately) desktop system that shipped this summer with a standard configuration of dual Intel Corp. Pentium processors, 32M bytes of RAM, a 535M-byte SCSI hard drive and a 600M-byte CD-ROM drive.

One participant was using the NCR 3430, which has dual Pentium processors but far greater disk storage for use as a network file server.

All were equipped with Microsoft Corp.'s Windows NT operating system and had similar architectures.

The evaluators included technical managers from a computer-aided design (CAD) software company, a graphics software company, a chemicals manufacturer and an engineering firm. They had been using and evaluating the NCR Pentium systems for one to six months.

Surprisingly, the three NCR 3360 users anticipated purchasing only a handful of units during the next year, explaining that they had no immediate need for its high-level performance. The engineering firm evaluator, who has just completed a month-long analysis of the 3360, said his company might buy as many as 15 units during the next two years.

The chemicals company user had already installed three 3430 network servers running Windows NT Advanced Server and SQL Server. He anticipated a large conversion to the 3430 configuration from other LAN servers currently running Novell, Inc.'s NetWare or IBM's OS/2. "I can collapse three Novell servers into one 3430 running Windows NT," he said.

The format for this evaluation was created with the help of Howard Rubin Associates and Technology Investment Strategies Corp.

Reliability

All of the evaluators had been pushing the system to its limits with program compilation, intensive graphics applications and working network programs. However, none reported any memorable crash or failure. Although they expected such behavior, they were impressed that the systems software (both NCR's and Microsoft's) did not exhibit any bugs or faults.

Performance

The evaluators were asked to rate separately computation and disk and video performance. They said the dual Pentium architecture of the systems provided outstanding computation performance but were marginally less complimentary of hard disk and video subsystems. All categories were still rated above average.

CAD software firm: "The 3360 is more than twice as fast as the fastest workstation we benchmarked, including [Sun Microsystems, Inc.'s] Spare 10."

Chemicals manufacturer: "The processors and I/O channels are both very fast and provide a balanced architecture."

Installation/Ease of use

The evaluators did not report any problems or exceptional improvements.

Technical support

The evaluators provided ratings for three separate technical support categories: responsiveness of support personnel and quality of support rendered.

In all categories, they gave NCR much higher than average ratings and lavished compliments on NCR personnel for responsiveness and competence.

Graphics software firm: "Responsiveness has been tremendous.

CAD software firm: "If we have any questions, or anything goes wrong, they are there."

Chemicals manufacturer: "We had a communications error and couldn't figure it out. They came in and debugged our network on a Saturday."

Expansion

Although users generally rated expansion capabilities slightly above average, the CAD software evaluator gave the NCR 3360 the highest rating based on his experience with other workstation vendors. He said the 3360 was significantly more expandable, at lower cost, than competitive systems.

CAD software firm: "The advantage is that you buy peripherals and memory with workstation performance, at PC prices."

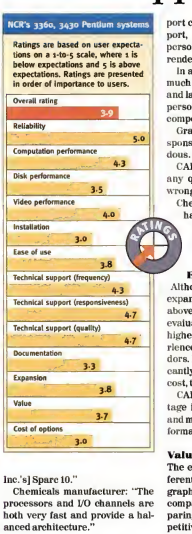
Value

The evaluators had markedly different perceptions of value. The graphics software and chemicals company evaluators were comparing their NCR systems to competitive systems based on Intel 1486 processors. They found the NCR Pentium systems to be radically more expensive than 486 machines.

The CAD software evaluator compared the 3360 to a variety of workstations and development systems including the Sun Spare 10 and the IBM RS/6000. He said the NCR 3360 was a much better value. The overall rating was still above average.

Graphics software firm: "It's best to compare [the 3360] against [Digital Equipment Corp.'s] Alpha or Mips [Technologies, Inc.'s] systems. But they're all a major leap in cost."

CAD software firm: "It provides more than twice the performance at one-sixth the price of IBM [RS/6000] systems."



NCR responds

▶ **Performance:** NCR has more than seven years of experience developing general-purpose symmetric multiprocessing systems and is recognized as the leader in this area. The 3360 and 3430 multiprocessing architecture utilizing dual-bus, simultaneous access to memory and system scalability will keep us ahead of the competition.

▶ **Who should buy:** NCR recommends that customers of the 3360 and 3430 be involved in areas such as Windows NT or Unix software development. They should use these systems as workstations and small workgroup branch servers.

Written by Computerworld *senior editor Garry Ray.*

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THE END-USER DEVELOPER:

FRIEND

AT ISSUE:
Products such as Lotus' Notes are ushering in a new era in which users can develop powerful systems on their own. What results, says Lotus' Jeff Papows, are better applications and help for IS. For developer Joe King, user involvement means chaos.

SOUNDOFF!

BY JEFF PAPOWS

User developers build better business systems

It's too late to debate whether end users should be invited into the application development process. They have already arrived.

Groupware, with the power it gives to end users, is the phenomenon that is forcing the development rules to change. Groupware products are both technologically and dynamically in tune with the user developer: The level of complexity varies with users' needs and knowledge. Entry-level users can whip built-in templates and examples into simple applications, while power users can take advantage of macros to help develop more sophisticated tracking and work-flow applications.

In this way, end users can become the most effective weapon against an applications backlog that can mount up to several years at the typical Fortune 1,000 company. And people who work in glass houses shouldn't be throwing stones at this idea: Information systems needs to stop hoarding development and realize the best thing that could happen to an organization is for users to develop what they need.

The benefits of harnessing user power into the development process are clear. For starters, no one has a keener insight into what makes an efficient and effective business application. It stands to reason that end-user developers will create — or quickly add — necessary function once they know they need it.

There is no opportunity for the messy and costly miscommunication that sometimes occurs in the typical development life cycle when users hand in their requirements and pass system specs to programmers, who hand applications back to users and so on.

Even more importantly, as users develop these systems, they can discover flaws in work flows that applications address.

At one New York-based advertising company, for instance, a cross-functional team of businesspeople, with little help from IS, planned to develop an automated traffic control system for projects. The groupware-based system was to replace the company's manual

Friend, *page 18*

◀ **JEFF PAPOWS:** *'IS needs to stop hoarding development'*



BRIAN GARVEY

or FOE?

BY JOE KING

If you want trouble, then let users develop

Don't be swayed by the popular myth that users are your programming resources of the future.

With the PC applications backlog what it is — at least three years, by my reckoning — it would be great to think that end users are the answer to the information technology group's prayers. What information systems manager would turn down a bunch of extra helping hands if it meant faster development?

But getting end users involved will do more harm than good.

I'm not talking about end-user development with personal productivity tools, such as spreadsheets, word processors and personal databases. That's baby stuff, stand-alone and isolated development that rarely has any ripple effect on applications and communications companywide.

Rather, the danger is letting end users go wild with new enterprise-wide multiuser application systems of which Notes, Objectvision and Visual Basic are all a part. Combine user-controlled development and the workgroup computing nature of such tools and you have the makings of a technology molotov cocktail.

Such products are a siren song to end users. They promise simplicity and ease. (Perhaps a new Dale Carnegie course is in order — "Yes, You, Too, Can Be an Application Developer.") Users don't have to wait around with their hair turning gray to get an application built. But are you prepared to have your users "simply" and "easily" handle complex communications software, administer a client/server environment, ensure security over multiplatform systems, distribute databases over a wide-area network and master multiple programming languages?

Yet these are all part and parcel of what it means to develop applications with Notes or Visual Basic or whatever. It's been my observation that the learning curve for Notes — and I'm talking about the learning curve for technical professionals — is long: about six months. Users take twice that time to come up to speed — if they ever do. Can your organization afford to have your users spend up to a year learning to be competent developers?

I'm not kidding when I say development can get complicated. Notes, for instance, doesn't sit there by itself; building a complete application often requires, say, Visual Basic or Objectvision. I know of one project that needed as many as seven separate products to build a single system!

You can't really expect users to master all of these tools. Even if they did, issues of design, data integrity and quality come into play.

I know one company whose business users built a slick shared database application on a LAN. But it took so much effort to maintain

Foe, *page 182*

▶ JOE KING: *'The danger is letting users go wild'*



Friend

CONTINUED FROM PAGE 180

nine-step time- and paper-intensive work-flow process. As the team mapped the work flow, it realized the process was a mess. It would be a mistake merely to automate it. For instance, there was no formal way to specify who would be a member of which project, to assign team duties or to set up teamwide briefings.

Because the developers were professionals integrally involved in the business, they picked up on the poor processes. IS would never have been able to.

This is heady — and empowering — stuff for users. "Suddenly, they see their own information needs being met and quickly envision myriad specific applications to be implemented," says the IS director at an accounting and consulting firm. He says the appeal of this kind of development is "almost visceral."

As users, excited and enabled by groupware, flock to the application development party, business organizations are starting to see quantifiable results in terms of reduced time to action and improved quality in business processes, including product development, account management and customer service.

One leading scientific equipment manufacturer I know of got a 20% increase in response after putting in a prospects and sales tracking system that an applica tions engineer and the company's direc tor of training created.

On the basis of this improved re sponse, the company estimates that i each rep makes one additional sales cal per week, it can bring in $4.3 million more in revenue annually.

As users are brought into the develop ment mix, the loudest applause should come from savvy IS professionals. Only those with their eyes on the past will be moan the rise of groupware as the fall o the IS profession. There's a chance for users and IS to work together.

That's because, as Mark LaRow, a con sultant at the Ernst & Young Center for Technology Strategy, points out, there is a shift occurring. Command, control and communications are no longer the driv ing forces in companies. Coordination cooperation and collaboration are what's in store for the future.

Users in the development process can't be ignored anymore.

Papows is vice president in the Notes Products Division of Lotus Development Corp. in Cambridge, Mass.

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Foe

CONTINUED FROM PAGE 181

that the support staff doubled. And then it doubled again. The system duplicated the existing corporate systems' data en try functions, and the company was left with data that did not balance. Data in tegrity has become a major issue.

While the rigors of design, analysis testing and methods are second nature to professional developers, users haven't been versed in these areas. And you can kiss documentation good-bye.

Also, when companies let their users take on development, users quickly dis cover that for their applications to have value (surprise!) they either have to ge data from or talk to older systems. So t ends up spending a good chunk of its tim figuring out how to integrate new an legacy systems. What starts out as a wa to shorten an applications hacklog end up adding to it instead.

I don't want to give the impression tha I'm not a big fan of these new develop ment tools. Quite the contrary. These tools can have a profound impact on th development life cycle. But *only if* deve opment is in the right hands.

It's not like users won't be involved i development at all; in fact, one of th things these tools have going for them i iterative and rapid development, whic brings users and developers together i a real-time "conversation." Users partic ipate actively, but control stays with IS.

I can't see why companies want to cr ate more development headaches tha they already have.

King is founder and president of Crossroad Pa ners, a Shrewsbury, N.J., consultancy specializ ing in Notes. Formerly assistant vice president of systems architecture at Continental Insurance Co., he can be reached at (908) 842-3527.

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COPING WITHOUT BOUNDARIES

By Alice Bredin

KEEPING up NARROW AND CLEARLY defined job descriptions have become a thing of the past in many information systems shops. In a recent survey, systems administrators and analysts across-functionality has been the biggest change they have experienced in the past year.

Increased demands on their time have left many struggling to keep up with old responsibilities while finding the time and means to learn new ones. Their biggest concern is balancing the two.

Until last year, Jan Zumwalt, a programmer/analyst at Bristol Bay Area Health Corp. in Dillingham, Alaska, spent his days programming and handling Unix systems administration. Things changed when the company brought in the X Window System.

Now Zumwalt spends most of his time ironing out the kinks and learning this new environment. His old responsibilities still exist, but he tends to them on a crisis-management basis only.

Like many others, his solution to the time crunch is to work more hours. Sixteen-hour days are the norm, and almost everyone works weekends and holidays. Zumwalt handles work on an emergency basis but no longer has the luxury of doling lower-priority tasks such as system auditing.

"The productivity increase is substantial because of the X Window [System], but as soon as we brought it in, we were busy," he says. "Now my job is a cross between attempting to keep promises and juggling the political pressures and priorities of the department."

Expanded job descriptions

Scrambling seems to be the only way to get things done, and for some, getting the right education is the solution. "Our job descriptions have expanded, and we're responsible for four to five times the amount of equipment than before," says Michael Sharpe, a computer specialist at Midlands Technical College in Columbia, S.C. For three years, he maintained systems at one of the school's three campuses. After several departments were consolidated, Sharpe's duties were significantly broadened. Now, he and his coworkers care for every technology.

"We are expected to work on new brands of equipment but haven't gotten training or documentation," Sharpe said. He has taken matters into his own hands and is seeking classes for the more complicated technologies that he handles.

Eventually IS staffers realize you just can't do it all and shouldn't try. Jeff Mullin, data processing coordinator at CPAC, Inc. in Leicester, N.Y., has a unique way of handling the overload. Once responsible for Macintosh support, he now handles a LAN and is learning a new manufacturing system software package and setting up an electronic-mail system.

As he migrates upward from one responsibility to the next, Mullin delegates some of his duties in order to manage his time. "Once I know something and it's running smoothly, I find someone to do the upkeep," Mullin explains. "If there's no logical choice, I let things fall behind, and someone gets frustrated and takes it over because I'm not giving them the response time they want."

Bredin is a free-lance writer in New York.

The ever-GROWING job

In a recent survey, IS professionals were asked how their jobs have changed in the past year

My job has become more . . .	
Cross-functional	52%
Technical	25%
Other	13%
Business-oriented	10%
Most important new skills learned are . . .	
Software	76%
LAN	64%
PC	56%
Interpersonal	53%

BASE: 107 systems administrators and analysts
Source: Computerworld Database Division, Framingham, Mass.

HELP is on the way

IS MANAGERS acknowledge that IS professionals are being overwhelmed by a growing list of responsibilities, and they want to help.

Bob Connelly, IS manager at Pfizer Food Service Group in New York, has seen his employees become buried in work during the last few years.

To help organize their time, he sends them to a training seminar called "Managing IS Priorities." The course teaches how to make priority lists and review them to reflect changes.

Similarly, Irving Ladue, IS manager at Data East, Inc. in Weare, N.H., also places a strong emphasis on organizing priorities and avoids assigning employees four or five projects at one time.

Managers also advise their staffs to speak up when feeling hurried. "When they do, I look at what they're working on and generally find they have too much to do. I help prioritize it or get rid of some," Connelly says. "But if they don't tell me, I keep piling it on."

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AS/400 sites seek PC expertise

With the introduction of the AS/400 Server Series, analysts predict that pure AS/400 expertise will be ousted in favor of a PC and local-area networking mix

NEED to know

By Sally Cusack

You may be overlooking a significant employment opportunity in an area confined to those specializing in RPG — the IBM AS/400.

According to information systems directors in AS/400 shops, opportunities exist for those with the right blend of PC savvy and LAN expertise. These skills are becoming increasingly essential as IBM takes its flagship midrange system into the client/server world.

With the introduction of the AS/400 Server Series earlier this fall, IBM has left no doubt that it is readying its 5-year-old line of proprietary minicomputer systems for 21st century open computing. IBM's communications software — Connection Program/400 — allows the system to support most major Unix workstation platforms and opens the field to those with Unix, PC and LAN connectivity qualifications.

"As companies get serious about integrating their AS/400s into client/server, they are going to need people certified in NetWare," says Theresa Elms, president of Elms Information Services Group, a research and consulting firm in San Diego. Elms adds that while the AS/400 will not run Novell, Inc.'s NetWare, it is now capable of more participation in a network.

Good news for the PC literati. According to Theresa Elms, president of Elms Information Services Group, in San Diego...

Subsequently, AS/400 IS shops must become network-literate to compete in today's computing environment.

AS/400 shops that have not yet decided to forge ahead are keeping their eyes on the new technology. Mark Harrington, systems analyst at Kendall Healthcare Products Co. in Mansfield, Mass., says the company is "looking into" client/server. "We haven't made any definite decisions yet," Harrington says. But PCs and LANs will play a larger part in Kendall's future, he says.

...approximately one-third of the devices attached to AS/400s today are PCs.

With three AS/400 F Series models currently installed, Harrington relies on a staff of 50 to keep things running smoothly. He estimates that a "couple hundred users" are tied to each system, operating from Intel Corp. 80386-based PCs. "There are still some dumb terminals around," Harrington says, "but these will be phased out over the next few years."

...Seventy percent of AS/400 sites have also installed LANs.

Kendall is typical of many AS/400 shops because previously it had relied on former IBM System/36 and System/38 facilities for its IS staff. However, things are starting to change. In addition to looking for staff with PC knowledge, the company is actively preparing its existing work force by offering in-house training for PC-to-AS/400 support.

Another wide avenue of employment within the AS/400 world can be found with third-party application developers. With more than 20,000 applications currently available, this sizable market is moving toward graphical user interface-based client/server platforms.

Kathleen Campbell, director of re search and development at Software 2000, Inc., a $50 million privately he firm in Hyannis, Mass., says she is strict ly focusing on client/server for research and development.

"I'm looking for people with a cli ent/server background — not necessar ily on the AS/400," Campbell says. Candi dates should have some familiarity wit communications and ideally have a dem onstrated competence in object-oriente programming and programs such as Dig italk, Inc.'s Smalltalk, she says.

More and more companies are als willing to train recruits on the new technology, and Software 2000 is no ex ception. The com pany provides a intensive three week course, run ning the gamu from object-orient ed analysis to GUI design.

Susan M. O'Connor, corporate recruit er for Software 2000, emphasizes that th company still actively searches fo AS/400 professionals, but the ideal can didate mix has changed. A year ago AS/400 experience in itself was the pr mary factor in choosing R&D, program ming and support employees. Today, PC skills are a must.

...With more than 225,000 AS/400s installed worldwide, that translates into a lot of opportunity.

Cusack is a free-lance writer in Marstons Mills, Mass.

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REGIONAL SCOPE

New York

by Jill Vitiello

Start spreading the news! Information systems professionals now in demand in the city that never sleeps are contractors with three or more years' experience in client/server environments.

Late last year, hiring freezes around New York began to thaw, allowing IS managers to fill vacant slots and attempt modest growth of IS staff. Now, however, companies nervous about repeating the staffing level mistakes of the 1980s are allowing full-time employee hiring and selecting contractors for short-term assignments.

Industry observers say the wave of hiring full-time IS employees crested earlier this year. Omega Fashions in New York is one example. At the beginning of the year, Michael LeVan, director of IS, hired three people — two network administrators and one IBM System/36 operator. In an IS shop of five, the addition of three people was big news, but LeVan has no immediate plans to hire more.

Recruiters, too, have tracked the shift away from hiring full-timers toward bringing in contractors. "Last year at this time, 70% of our openings were for full-time IS employees and about 30% were for consultants," says Meyer Feig, president of International Business Applications, a recruiting firm in the city. "Now it's just the reverse — about 70% are for consultants, and 30% are for full-time employees."

No matter what they're called — consultants or contractors — companies are calling them up more than any other IS professional right now. And they fill a variety of niches.

Management consulting firms, for example, are deliberately hiring a mix of full-time IS professionals and contractors to meet their clients' needs.

"When we conduct project work for our existing clients, we generally use our full-time employees," says Lewis Berlent, manager of professional staffing at Coopers & Lybrand Solutions Through Technology Group, an IS practice of some 150 professionals. "We also supply technical expertise and services and will often hire short-term contractors for those projects."

Spanning technologies

Berlent is in the process of filling about seven positions. He is looking for senior programmer/analysts and project managers with the skills most hiring managers seek — experience in Unix, graphical user interfaces, LANs, wide-area networks and relational databases.

Because so many of his company's clients are migrating from mainframes to client/server platforms, Berlent is also interested in finding IS folks with experience that spans both client/server and mainframe technologies. He points out, however, that many whose skills are limited to mainframe maintenance are not working — victims of the downsizing trend still lurking at some firms.

However, cutting outdated jobs often opens opportunities. Just this summer, Matthew Bender & Co., a legal publisher, reduced its IS staff by half, dropping to about 100 people. That paved the way to bring aboard two analysts and one programmer, positions that IS manager Don Eddy is still trying to fill. "We're having a tough time finding people with the right combination of distributed processing skills and business analysis experience," Eddy says.

Job market is better

For IS professionals in New York with no interest in consulting, the good news is that the full-time job market is still much better than it was a year ago. One particular position that keeps popping up is systems administrator.

"The explosion in Unix workstations and the decentralization of computing has created a tremendous need for systems administrators," says Richard Wonder, director of the IS division at Robert Half International, Inc. in New York.

Wonder reports that he is recruiting for more than 200 openings, but that employers are being very selective about candidates. The prize of a plum job is well worth the wait: Wonder says he is placing senior programmer/analysts in full-time jobs paying $70,000 to $80,000. That makes for a pretty juicy Big Apple.

Vitiello is a free-lance writer in East Brunswick, N.J.

NEW YORK

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Source: The National Association of Realtors, Washington

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4. Mount Sinai Hospital, Inc.
5. Morgan Guaranty Trust Company of New York

Source: Dun's Business Rankings for 1993

UNEMPLOYMENT AVERAGE

1992	10.8%
Sept. 1993	8.7%

Source: Bureau of Labor Statistics, New York

1992 COMINGS AND GOINGS

New York metropolitan area

People moving in:	7,763
People moving out:	13,455

Source: Quarterly marketing study of 10 member carriers of the American Mover's Conference/Household Goods Carrier's Bureau, Alexandria, Va.

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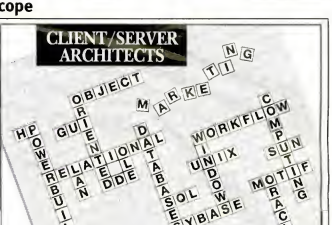
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OPEN HOUSE
Wednesday, November 17 3pm to 7pm
THE COPELAND COMPANIES
Two Tower Center, East Brunswick, NJ

The following opportunities are available immediately:

PROGRAMMER ANALYST

Successful candidate will have a BS in Computer Science or equivalent, and a minimum of 2-4 years DP experience with COBOL or RPG. IBM AS400 required; knowledge of insurance or annuities business or financial systems experience helpful.

OPERATIONS ANALYST

This position is responsible for testing software, user training, business analysis & maintaining documentation. Requirements include a Bachelor's degree with computer literacy, excellent communication skills and proven analytical skills. Some business experience in a corporate environment preferred.

PC PROGRAMMER

Successful candidate will have a BS in Computer Science or related field; 1-2 years IBM PC experience with C required. Experience with Clipper and/or DBase desirable. Knowledge of LANs & Client Server computing helpful.

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Sr. Programmer Analysts

Will formulate/define system scope and objectives. Devise or modify procedures to solve complex problems involving computer capacity/limitations, operating time and form of desired results. Prepare detailed specifications and design, code, test, debug and document programs.

Requires at least 4 years' mainframe programming experience in new applications development/maintenance. Must have programmed on-line and batch applications using relational databases. Merchandising applications, SQL, 4GL, DATACOM, IDEAL and PC development background is highly desirable.

Programmer Analysts

Duties similar to those for Sr. Programmer Analyst, but requires less complex knowledge. At least 2 years' mainframe experience in new applications development and maintenance is essential. Understanding of financial applications, SQL, 4GL, DATACOM and IDEAL is desirable. PC development experience a plus.

We offer a competitive salary, comprehensive benefits and opportunity for advancement. For prompt consideration, please fax (203)849-2135 or send your resume to: **Dept. SPA, Human Resources, Caldor, Inc., 20 Glover Avenue, Norwalk, CT 06856.** *(Only those candidates whose qualifications meet our requirements will receive a response.)* Equal Opportunity Employer.

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- Powerbuilder
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PROGRAMMERS PROGRAMMER ANALYSTS

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Programmer Analyst

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The successful candidate will work with management in formulating the Client's system architecture, will develop structured programming guidelines for the development team and will play a lead role in the development effort. Prior experience in programming design, leadership, Distributed processing, Client/Server technology, C, SQL and specification writing are minimal requirements. For more information, consideration and a phone interview, please call (Mr.) Diye Obaid (Account Manager) at (212) 406-0340 ext CW1, (off hrs leave msg), Fax: (212) 374-1434 or send resume to:

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Software Eng Consultant: Must have MS in Comp Sci, Eng or Physics w/ 1 yr exp in job or 2 yrs exp in s/ware sys dvlpment & analysis or BS w/ 4 yrs exp. Must have 2 yrs exp dvlping comp sys for business applications & wrking w/Sybase relational dbases. Must be proficient in: Unix systems, SunSparc Stations, Sybase applications, Powerbuilder, Case Tools, C, C++, Pascal, Cobol, & Fortran. Must be willing to relocate throughout US for varying periods of time. Will dsgn, dvlp & implement lrg application comp s/ware sys, using business & eng analysis, math models, computer languages & databases, primarily Case Tools & Sybase applications, & wrking in 1 or more h/ware &/or s/ware environments simultaneously for complex business projects in-house or at client locations; analyze user's sys requirements, consult w/clients & sys engineers; study & perform sys analysis on existing sys on different platforms; analyze s/ware requirements for interface w/ h/ware; dvlp specs; monitor phys aspects including installation, data propagation, optimization, performance tuning & maintenance support (debugging, modifications, fine-tuning & code organization); dvlp acceptance criteria; provide guidance to programmers; train users & monitor results; document plan & perform maintenance support; provide tech assistance in prep of reports, user & instructional manuals. Salary $42,000/yr. 40 hrs. Several positions available. Apply in Person or By Resume To: GA Dept of Labor, 1275 Clarendon Ave., Avondale Estates, GA 30002 or nearest GA Job Service Center. Refer to Control # GA 5671111.

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We seek at least 12 years of experience that reflect thorough knowledge *and experience* in systems programming, analysis, design, and management. Familiarity with the healthcare industry is a must, as is a 4-year degree or the equivalent in business or computer science. Advanced degree in computer science is preferred. For details and consideration please send resume with salary requirements to: **FIRST HEALTH Services Corporation, Human Resource Dept., 2506 Lakeland Dr., Suite 101, Jackson, MS 39208.**

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PROGRAMMER ANALYST

Reporting to a Team Leader, this position participates in analysis, program design, coding and testing to produce solutions to user requirements for mainframe and mid-size computers. You will help design and develop individual programs from high-level specifications and test this work to assure a high level of quality. You will analyze and resolve problems, test all changes. A Bachelor's degree plus a minimum of one year's programming experience in Natural 2 are required.

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The Medical Center Hospital of Vermont seeks a highly motivated individual to join our Information Services team as Manager of Technical Support.

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Data Processing

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Qualifications include formal education acquired beyond a Bachelor's degree level or a combination of a Bachelor's degree and completion of a professional/technical designation. Twelve years of executive level experience with preference given to candidates with insurance industry experience. Demonstrated leadership ability through project management, ability to interpret company goals and philosophy as demonstrated by implementing action in line of business for achievement of goals, and exceptional communication skills including facilitation and platform abilities also required.

If you have successfully managed a profit center's I/S function and are looking for an executive leadership position, we would like to talk to you. For immediate, confidential consideration, please mail or FAX your resume to: C. V. Moore, 3910 Keswick Road, Baltimore, MD 21211, FAX#: (410) 338-9222. Principals only.

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Manager, Human Resources
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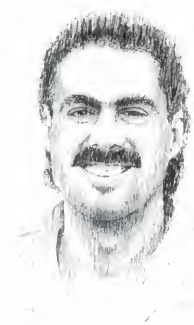
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BEST READ

NPFs nickel-and-dime bottom line

NPF *n* (no problems found): A term used in the storage industry when a SCSI device is returned to the manufacturer for repairs and, after much testing, no problems are found. If not controlled, NPFs can potentially cost thousands of dollars.

By Christina Avallone

The phenomenon of "no problems found" is to the corporate bottom line what eating out every night is to your budget — a slow but sure erosion of funds that are better spent elsewhere.

"No problems found," otherwise known as NPF, is a term that SCSI drive manufacturers use when, after much testing, the disk errors experienced by a customer cannot be duplicated by the manufacturer. When the drive is returned to its owners, a NPF tag is attached along with a service bill for each drive.

A manufacturer spends an average of five hours finding and fixing an error in a disk that actually has a problem. Sometimes in-house technicians cannot pinpoint the faulty drive and must return all of the questionable ones. For drives without problems, however, approximately 10 hours are spent trying to duplicate the error described by the customer.

These services aren't cheap. Maintenance on SCSI devices usually costs between $200 and $600 per drive, and experts estimate that many companies average five to six NPFs per month — a potential $40,000 a year just to learn that there is nothing physically wrong with your SCSI drives.

Experts estimate the NPF return rate to be as high as 30% to 35% of all annual drive returns to manufacturers. The causes of these returns vary. The usual source, however, is the drive's incompatibility with the system.

The American National Standards Institute has outlined a set of mandatory commands for SCSI compliance in an attempt to make all SCSI devices generic. Vendors, however, add their own specifications and commands, allowing drives to perform tasks not envisioned by these specifications. Given these variations, it is likely that a technician will at some point install into a system several different SCSI devices that do not comply with the disk vendor's specifications.

shopper alert!

For example, when a bug is detected in a drive, the manufacturer often sends the customer a floppy disk containing microcode that updates the existing firmware, fixes bugs and enhances the drive's performance. The ability to download the microcode is written into the set of mandatory SCSI commands, but the ability to read it is determined by the manufacturer. A vendor-unique command might allow a user to read the microcode, but because it is not universal for all SCSI devices it may contribute to compatibility problems if the system does not support this feature.

While every company using SCSI devices is bound to have an occasional NPF, companies averaging three to five NPFs a month should be concerned. Depending on the volume of SCSI devices that your company employs, an investment in a generic SCSI hard drive tester may be justified to screen out suspect drives.

Choosing a tester

SCSI tester options include generic and user-developed. A generic tester examines drives independently of the manufacturer and configuration. It has built-in diagnostics and failure analysis features that locate errors, determine the cause and suggest a fix.

User-developed programs require the user to write a test program. This allows you to set the parameters for drives but requires extensive SCSI and programming knowledge.

If generic testers are used by both a customer and u manufacturer, the results are repeatable when a problem occurs. When home-grown programs are used, enough variation may exist in how the tests are programmed and executed to contribute to another NPF cycle. — *Christina Avallone*

Avallone is an independent storage consultan in Santa Monica, Calif.

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Friday Stock Ticker

Gainers

Percent

Data Race Inc.	61.3	
Peerless Inc.	45.5	
Western Digital Corp.	30.8	
Broadmoor Technology	23.0	
Chips and Technologies	16.2	
Interplay Inc.	16.0	
Micrage Inc.	15.7	
Shamanex Software	15.0	

Dollar

Carleton Systems	11.00
Newbridge Networks Corp.	8.00
Texas Instruments	7.25
DSC Communications	7.13
Micrage Inc.	6.75
Wellfleet Communications	6.25
Micron Technology	5.13
Matsushita Electronics	5.00

Losers

Percent

Group I Software	-22.0
Kendall Square Research	-21.1
Sun Systems Inc.	-21.1
Countrywide Corp.	-14.6
Inacom Corp.	-12.4
Exsel Corp.(I)	-12.2
Fibronics Int'l, Inc.	-12.0
Up Graphics	-7.4

Dollar

Progress Software Corp.	-4.00
Bellsouth Corp.	-3.38
Kendall Square Research	-2.88
Bell Atlantic Corp.	-2.38
Group I Software	-2.25
Ibm Kobitic	-2.25
American Info Techs Corp.	-2.25
Wellfleet Communications	-2.00

Networking stocks sizzled last week. Carleton, Newbridge Networks and DSC Communications all resumed upward lost over the previous month. Data Race, a relative unknown, small modem and multiplexer manufacturer, announced a spate of new wireless and cellular products.

Industry Almanac

A safe stock is hard to find

With a solid share price and a big dividend, IBM used to be the safest stock around. In light of IBM's troubles, what are the most conservative computer industry investments?

Stephen McClellan
First vice president, Merrill Lynch Securities

"Automatic Data Processing. They have 33 consecutive years of double-digit growth, every quarter. And they do pay a dividend. If you want stability, that's it. It's in the services business, not software, not hardware."

Neeraj Vohra
Analyst, Standard & Poor's Corp.

"As for dividends, Hewlett-Packard yields about 1%. [The] yield is a firm dividend as a percent of its share price.] IBM yields about 3%, and that's a conservative, solid company, although it's only marginally in the computer industry. Xerox has a yield of about 4%, but I don't know whether I would characterize it as a 'safe, conservative' stock.

"I'm still kind of bullish on Digital in the long term. Obviously it is taking a lot longer to turn around than people wanted, but I think we've had the long-term at stock price.

"The older companies that you might think of as safe are all going through that same transition that IBM is — from host to client/server technologies. I hesitate to call anything I follow safe. For years health care stocks and food companies were safe, and IBM was the safest stock around. Now they're all having problems."

— Compiled by Derek Slater

The big guys

IBM clings to a narrow lead in market capitalization; Cisco has climbed the list over the past eight months, while Novell has fallen

	Price 12/18/93	Shares outstanding (millions)	Market cap ($ millions)
IBM	49[7]/8	573	$28,581
Intel Corp.	63[1]/2	439	$27,846
Microsoft Corp.	81[3]/4	284	$23,112
Hewlett-Packard	79[1]/8	253	$20,083
Automatic Data Processing, Inc.	53[7]/8	141	$7,597
Cisco Systems, Inc.	54[3]/8	132	$7,176
Novell, Inc.	22[1]/2	314	$7,065

Exch	52-Week Range		Nov. 12 Wk Net · Wk Pct · 3 PM Change Change
Communications and Network Services		**UP 4.93%**	
OTC	4.00 19.63	Com Corp.	18.75 4.13 3.10
NYS	31.13 63.88	American Info Techs Corp.	60.75 -2.25 -2.7
NYS	45.00 45.75	AT&T	57.38 1.38 2.5
OTC	4.44 0.75	Attel Communication Group	3.19 0.44 15.9
OTC	24.50 67.50	Banyan Systems Inc.	23.00 -2.25 -10.8
NYS	69.13 45.00	Bell Atlantic Corp.	61.38 -2.38 -3.7
NYS	6.63 3.50	Bellsouth Corp.	3.88 -0.38 -5.6
NYS	14.75 4.25	Bolt, Beranek & Newman	12.88 0.25 2.0
OTC	18.50 9.50	Broadmoor Technology	11.75 3.25 38.3
NYS	119.00 66.75	Cabletron Systems	99.38 11.00 12.4
OTC	16.50 11.88	Carleton Communications	13.00 -1.50 -4.3
OTC	55.50 22.88	Cascom Corp.	50.50 4.50 9.8
OTC	29.75 7.38	Cisco Systems Inc.	54.38 2.88 5.6
OTC	18.38 8.00	Compression Labs Inc. (N)	16.00 -0.50 -3.0
OTC	12.00 4.00	Compuserve Inc.	11.75 1.13 10.6
NYS	9.50 5.00	Data Switch Corp. (L)	7.00 -1.25 -15.1
NYS	17.88 12.38	Digital Comm. Assoc. Inc. (L)	18.75 0.13 0.7
OTC	7.63 3.25	Digital Systems Int'l, Inc.	3.81 -0.06 -1.5
OTC	73.13 17.75	DSC Communications	66.88 7.13 11.9
OTC	9.50 4.00	Dynatech Corp.	5.38 -0.75 -12.2
OTC	24.00 8.75	Filenet Corp.	17.75 -0.50 -2.7
OTC	13.00 4.75	Gandalf Technologies Inc.	5.13 -0.25 -4.7
OTC	2.06 0.69	Gateway Communications	1.00 0.19 23.0
NYS	19.50 7.25	General Datacomm Inds.	10.88 0.38 3.6
ASE	3.75 2.00	Go Video	2.44 0.13 5.4
NYS	39.88 33.13	GTE Corp.	34.75 -0.88 -2.5
NYS	94.75 68.25	ITT Corp.	91.75 0.88 1.0
OTC	20.50 7.50	Lan Systems Inc.	20.25 3.00 17.4
OTC	6.50 1.50	Microcom Inc.	2.88 0.06 2.2
OTC	29.25 3.50	Network Computing Devices	5.75 0.63 12.3
OTC	19.00 6.50	Network Computing Devices	7.75 -0.25 -3.1
OTC	7.38 2.75	Network Equipment Tech.	3.75 0.06 1.7
OTC	13.50 5.13	Newbridge Networks	14.63 1.75 13.6
OTC	15.63 6.00	Network Systems Corp.	8.00 -0.38 -4.5
OTC	33.13 17.75	Novell Inc.	65.00 -8.00 -10.9
NYS	46.00 21.38	Northern Telecom Ltd.	36.88 -0.25 -0.9
OTC	10.00 3.75	Novell Inc.	9.38 0.38 5.7
NYS	48.88 40.00	Nynex Corp.	42.88 1.00 2.4
OTC	12.00 10.00	Octel Communications Corp.	10.38 0.38 3.7
OTC	6.13 3.75	Pemtel Data Comm Networks	5.38 0.06 1.2
OTC	16.50 14.50	Proteon Int'l. Corp.	20.25 1.38 11.0
OTC	11.50 7.63	Proteon Inc.	7.38 2.13 40.5
NYS	38.88 31.75	Scientific Atlanta Inc.	34.63 -1.38 -3.8
NYS	47.00 32.25	Southwestern Bell Corp.	40.88 -1.25 -3.0
NYS	60.25 51.25	Sprint Corp.	56.25 1.38 2.5
OTC	27.00 12.50	Standard Microsystems Corp.	24.88 3.38 15.7
OTC	10.00 4.00	Sun Systems Inc.	7.75 -2.06 -21.1
OTC	23.00 8.00	Synoptics Communications	20.00 -0.50 -2.4
OTC	9.88 3.88	Telebit Corp.	7.13 -0.50 -6.6
NYS	47.13 37.00	Telesciences Inc.	35.13 -1.38 -3.8
OTC	35.25 17.00	US Robotics	28.00 -2.25 -7.4
NYS	50.75 33.50	US West Inc.	43.75 -0.63 -1.4
OTC	57.75 28.25	Wellfleet Communications	57.75 6.50 12.7
NYS	19.00 17.25	Xircom	17.25 1.50 9.5
PCs and Workstations		**UP 8.19%**	
OTC	5.56 2.50	Advanced Logic Research	3.50 0.25 7.7
OTC	65.25 22.00	Apple Computer Inc.	31.75 0.00 0.0
OTC	24.25 7.38	Ast Research Inc.	21.75 3.00 14.5
NYS	9.25 2.50	Commodore Int'l.	4.00 -0.13 -3.0
OTC	7.75 2.00	Compaq Computer Corp.	68.75 3.13 4.8
OTC	49.88 13.50	Dell Computer Corp.	26.13 4.13 18.8
OTC	49.00 14.75	Hewlett Packard Co.	78.13 4.63 6.3
NYS	46.75 23.50	Silicon Graphics	45.38 4.63 11.3
OTC	14.75 5.00	Sun Microsystems Inc.	13.75 1.25 10.0
OTC	26.38 9.63	Tandy Corp. (D)	26.63 0.38 1.4
OTC	7.00 2.50	Zeos International Ltd.	4.63 0.88 23.3
Large Systems		**UP 3.25%**	
ASE	8.50 4.38	Amdahl Corp.	5.00 0.25 5.3
NYS	8.75 5.38	Cray Computer	5.25 0.13 2.4
OTC	5.38 2.25	Cray Computer	2.75 -0.13 -4.3
NYS	13.88 10.25	Cray Research Inc.	36.75 -0.25 -0.7
NYS	13.88 7.75	Data General Corp.	9.88 0.50 5.3
NYS	13.75 7.25	Digital Equipment Corp.	12.50 0.88 7.6
NYS	47.38 32.50	Harris Corp. (D)	66.50 1.13 2.5
OTC	4.00 1.75	Hitachi	3.00 0.00 0.0
NYS	18.75 11.88	Honeywell Sperry Rissman	18.75 -0.63 -3.2
NYS	141.50 83.00	Matsushita Electronics	136.50 5.00 3.8
OTC	23.75 12.75	Nittfang	17.25 1.00 6.2
OTC	26.00 9.25	Parallan Computer	18.00 -0.25 -1.4
OTC	23.25 9.50	Pyramid Technology	11.25 0.75 7.1
OTC	24.00 11.25	Sequent Computer Sys.	18.75 1.50 8.7
OTC	17.50 4.00	Stratus Computer Inc.	13.75 0.00 0.0
OTC	41.25 20.25	Stratus Computer Inc.	27.75 0.63 2.3
NYS	16.88 8.50	Tandem Computers Inc.	11.63 -0.06 -0.5
OTC	26.75 10.63	Tricord Systems	26.75 2.63 10.9
NYS	17.50 8.00	Unisys Corp.	11.63 0.75 6.9
Software		**UP 5.45%**	
OTC	37.00 14.50	Adobe Systems Inc.	19.88 0.88 4.6
OTC	19.25 11.75	Aldus Corp.	17.00 2.00 13.3
OTC	11.00 5.50	American Software Inc.	7.75 -0.38 -4.6
OTC	14.00 5.00	Arbor Software Systems	11.75 1.13 10.6
OTC	56.75 37.00	Autodesk Inc. (L)	41.25 2.88 7.5
OTC	7.25 2.38	Boeing Computer Systems (G)	2.88 -0.13 -4.2
OTC	43.00 24.00	Bgs Systems Inc.	26.00 0.50 2.0
OTC	18.13 11.75	Bmc Software Inc.	49.00 2.00 4.3
OTC	28.25 20.38	Book & Barnaise	27.00 0.75 2.9
OTC	21.00 7.25	Borland Int'l. Inc.	17.50 -0.88 -4.8
OTC	5.00 2.75	Ce Software	3.63 -0.19 -4.9
ASE	40.25 23.00	Cognos Inc.	32.75 0.75 2.3
OTC	19.50 8.25	Chipsoft	18.38 2.88 18.5
OTC	19.50 9.00	Compuware Corp.	8.88 -0.06 -0.7
NYS	42.38 16.50	Computer Associates	42.38 4.88 13.0
OTC	4.75 1.75	Computer Horizons	3.25 0.13 4.0
OTC	34.00 19.13	Computervision Corp.	25.75 1.75 7.3
OTC	16.75 5.75	Cowcaware Inc.	10.25 -0.50 -4.7
OTC	10.00 4.75	Cork Corp.	6.38 0.13 2.0
OTC	19.25 5.50	Easel Corp. (L)	4.50 -0.63 -12.2
OTC	24.75 13.75	Electronic Arts	24.00 2.00 9.1
OTC	19.25 5.25	Frame Technology	10.25 0.50 5.1
OTC	37.50 8.00	Group I Software	22.75 -5.25 -22.0
OTC	35.25 14.00	Gupta	15.25 0.25 1.7
OTC	18.00 4.50	Hogan Systems Inc.	11.00 0.13 1.2
OTC	27.75 11.25	Imris	24.25 -0.50 -2.0
OTC	12.50 4.00	Information Resources	10.63 1.13 11.8
OTC	27.25 13.38	Informix Corp.	19.00 2.25 13.4
OTC	6.00 2.38	Interleaf Inc.	4.00 0.13 3.2

Exch	52-Week Range		Nov. 12 Wk Net · Wk Pct · 3 PM Change Change
OTC	13.63 4.88	Interleaf Inc.	7.88 1.63 26.0
OTC	15.25 4.75	Intuitive Inc.	5.50 0.63 1.8
OTC	14.75 7.75	Kronos Software Inc.	11.50 -0.50 -4.2
OTC	34.25 15.50	Legent Corp.	23.50 -0.50 -2.1
OTC	19.00 18.75	Lotus Development	44.00 4.50 10.1
OTC	23.00 4.25	Mathsoft	6.88 1.25 22.2
OTC	21.25 6.00	Mcafee Associates	6.25 0.13 2.0
OTC	11.63 3.38	Meca Software	6.50 0.00 0.0
OTC	6.00 3.00	Mentor Graphics	3.00 0.13 4.3
OTC	46.00 19.75	Micro Focus	22.50 -0.13 -0.6
OTC	15.75 6.50	Micropro Int'l.	8.25 0.25 3.1
OTC	98.00 70.38	Microsoft Corp.	82.00 3.50 4.5
OTC	32.50 21.63	Oracle Corp.	31.75 2.00 6.7
OTC	46.75 22.50	Parametric Technology	39.13 1.13 3.0
OTC	17.00 8.25	Progress Soft	11.75 -4.00 -25.4
OTC	13.25 3.50	Progress Technologies (L)	4.75 0.75 17.8
OTC	6.75 3.00	Quarterdeck Office Sys.	4.75 0.25 5.6
OTC	25.00 7.75	Quarterdeck Office Sys.	19.00 -0.75 -3.8
OTC	25.00 7.25	Platinum Technology	10.13 0.88 9.5
OTC	25.00 7.75	Powerhouse Software Corp.	10.00 0.00 0.0
OTC	6.63 1.94	Quarterdeck Office Sys.	2.44 0.25 11.4
OTC	19.00 6.00	Quarterdeck Office Sys.	13.00 -0.50 -3.7
OTC	11.38 4.25	Rasterops	8.00 0.88 12.3
OTC	15.25 6.50	Rose Electronics	8.25 0.25 3.1
OTC	28.75 16.63	Sapiens Int'l. Corp. N.V.	24.00 -1.25 -5.0
OTC	14.50 5.50	Software Publishing Corp.	6.50 0.63 6.1
OTC	17.25 4.88	Software Toolworks Inc.	14.50 0.63 4.5
OTC	47.25 25.75	Spectrum Holobyte	7.81 0.56 7.7
OTC	13.75 6.50	State of the Art	9.50 0.25 2.7
OTC	14.50 6.00	Stratus Computer	12.63 1.86 17.3
OTC	23.63 9.63	Struct. Dynamics Research	18.50 2.63 16.5
OTC	17.00 8.00	Symantec Corp.	11.50 3.75 48.7
OTC	20.50 9.25	Symmetry Corp.	19.00 0.88 4.8
OTC	26.75 13.00	Systems & Comp. Assoc.	25.75 1.75 7.3
OTC	6.38 2.50	Telesoft	4.38 0.00 0.0
OTC	26.50 13.50	Viewlogic Systems	23.50 1.00 4.4
OTC	9.50 5.00	Visual Interactive Systems	8.50 0.63 8.0
OTC	5.19 0.84	Wordstar	1.50 0.19 14.2
Semiconductors		**UP 10.63%**	
NYS	32.88 14.25	Advanced Micro Devices	19.88 0.63 3.2
OTC	5.00 2.00	Altera Corp.	3.44 0.38 12.5
OTC	38.63 14.00	Atmel Corp.	27.75 1.63 6.2
OTC	14.63 5.38	Chips and Technologies	9.63 1.38 16.7
OTC	39.75 13.00	Cirrus Logic	36.00 2.38 7.1
OTC	17.00 8.75	Cypress Semiconductor Corp.	13.00 1.25 10.6
NYS	19.00 11.13	Dallas Semiconductor	15.50 0.38 2.5
OTC	19.00 10.00	Exar Corp.	15.50 1.38 9.8
OTC	26.00 12.50	Integrated Device Tech.	23.00 1.50 7.0
OTC	26.75 13.66	Lattice Semiconductor	15.50 0.25 1.6
OTC	63.75 31.50	Linear Technology	45.00 1.25 2.9
NYS	107.50 47.69	Motorola Inc.	103.00 4.75 4.8
OTC	23.75 7.75	National Semiconductor	17.63 1.00 6.0
OTC	15.75 6.50	Sierra Semiconductor	8.75 1.25 16.7
OTC	12.75 7.50	Sipex	8.50 0.25 3.0
NYS	84.25 45.13	Texas Instruments	65.50 7.25 12.4
OTC	18.88 6.50	Vlsi Technology	14.13 2.25 18.9
OTC	14.38 4.38	Weitek	11.50 1.63 16.5
OTC	14.25 6.50	Western Digital Corp.	10.13 2.50 32.8
OTC	54.50 18.25	Xilinx	40.25 1.88 4.9
OTC	39.50 14.50	Zilog	38.50 4.50 13.2
Peripherals and Subsystems		**UP 3.56%**	
OTC	24.75 10.50	American Power Conversion	20.88 0.13 0.6
OTC	22.75 15.50	Banctec Inc.	20.25 0.25 1.3
OTC	14.75 5.50	Conner Peripherals	9.75 0.25 2.6
OTC	19.00 7.00	Cordata Technologies Inc.	5.13 -0.88 -14.6
NYS	25.50 9.00	Cornrer Peripherals	12.75 1.25 10.9
OTC	23.75 17.50	Creative Technologies Inc.	17.75 2.00 12.7
OTC	30.75 6.50	Data Race Inc.	12.50 4.75 61.3
OTC	14.25 6.00	Data Switch Corp.	9.75 1.13 13.1
NYS	39.00 8.34	Emc Corp.	34.38 1.50 4.6
OTC	17.00 8.25	Exabyte Corp.	6.38 0.13 2.0
OTC	19.00 14.00	Exams & Software Land	18.00 0.38 2.1
OTC	15.50 7.00	Exide	15.88 0.25 1.6
OTC	34.00 10.41	Intelligent Instr. Systems	27.38 0.00 0.0
OTC	4.50 2.50	Iomega Corp.	3.50 0.50 16.7
OTC	14.25 5.75	Ips Systems Inc.	7.00 -0.50 -6.7
OTC	14.50 6.75	Kenetech	8.50 0.00 0.0
OTC	18.75 10.00	Maxtor Corp.	14.50 0.63 4.5
OTC	10.00 5.75	Microplex Corp.	7.25 0.50 7.4
OTC	137.00 49.00	Mylex	109.63 7.13 7.0
OTC	8.00 4.00	Printronix Inc.	7.00 -0.25 -3.4
OTC	19.25 8.75	Qualstar Corp.	10.50 -0.25 -2.3
OTC	17.88 9.38	Quantum Corp.	14.13 1.75 14.1
OTC	12.50 4.00	Seagate Technology	10.63 1.63 18.1
OTC	17.75 11.75	Recognition Equipment	16.50 1.25 8.2
OTC	5.25 2.50	Tandon Corp.	4.25 0.25 6.3
OTC	25.13 13.13	Silgate Technology (D)	24.63 1.63 7.1
OTC	13.00 5.00	Storage Technology	10.00 3.63 57.0
NYS	27.88 17.63	Tektronix Inc.	22.75 -0.38 -1.6
NYS	68.88 68.00	Xerox Corp.	81.63 -1.13 -1.4
Services		**UP 2.78%**	
NYS	4.38 1.50	Alleghin Inc.	3.50 0.63 21.7
OTC	17.25 10.00	Automatic Data Systems	17.25 0.25 1.5
OTC	4.75 2.38	Anacomp Inc.	3.38 0.25 6.9
OTC	37.88 14.34	Analysts Int'l.	17.75 0.75 4.4
NYS	56.13 46.88	Auto Data Processing	54.25 3.13 6.1
OTC	18.50 6.00	Business Land	18.50 0.63 3.5
NYS	21.00 13.13	Comdisco Inc.	19.13 0.38 2.0
OTC	17.50 8.00	Computer Sciences	12.00 0.13 1.1
OTC	13.00 7.50	Computer Sciences	9.88 1.13 12.9
OTC	22.75 0.38	Computer Task Group	1.63 0.13 8.3
OTC	37.00 19.00	Compusa Inc.	26.38 0.63 2.4
OTC	8.88 4.00	Computer Systems Inc.	4.75 0.13 2.7
OTC	15.88 7.00	Corporate Software (N)	15.50 0.38 2.5
OTC	19.75 9.00	Data Processing Resources	9.75 0.00 0.0
OTC	16.50 6.88	Dental Benefits E (DS)	11.75 0.00 0.0
OTC	25.50 13.25	Inacom Corp.	15.00 -2.13 -12.4
OTC	10.75 6.00	Information Architects	7.25 0.38 5.5
OTC	17.00 9.63	Merisel	15.63 1.13 7.8
OTC	12.75 7.75	Olsten Corp.	10.50 0.00 0.0
OTC	37.00 21.50	Paychex (D)	37.00 1.75 5.0
OTC	87.25 21.63	Policy Management Sys.	26.00 1.13 4.5
OTC	43.63 24.13	Reynolds and Reynolds	42.75 2.50 6.2
OTC	11.00 5.00	Sei Corp.	22.75 0.00 0.0
OTC	26.00 17.50	Shared Medical Systems	22.13 -0.50 -2.2
OTC	32.13 19.88	Sungard Data Systems	7.50 -2.00 -21.1
OTC	30.75 20.00	Software Spectrum Inc.	23.50 2.00 9.3
OTC	42.75 26.25	Standard Data Systems	37.63 1.13 3.1

KEY: (N) = New annual high reached in period (L) = New annual low reached in period
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In Brief

AST restructures

AST Research, Inc. will cut its work force during the next six months by 16% — or 1,050 positions — following its June acquisition of **Tandy Corp.**'s PC operations. The Irvine, Calif., PC maker has already taken a onetime pretax charge of $125 million in the fiscal fourth quarter ended July 3 to cover restructuring costs. The cuts will be offset, however, by the addition of 850 jobs at AST's Fort Worth, Texas, and Limerick, Ireland, plants.

Wyse buys Qume

Wyse Technology, Inc. in San Jose, Calif., is purchasing **Qume Corp.**'s terminal and printer businesses — including the Qume brand name — in a deal valued at $13.8 million. Qume will continue in the storage controller market under the **Data Technology Corp.** name. That business generates $12 million in annual revenue, the Milpitas, Calif., firm said.

Cisco posts gains

Cisco Systems, Inc. posted fiscal first-quarter net profits of $33.2 million, an increase of 91% from the same period last year. Sales in the period grew 97% to $248.4 million, the Menlo Park, Calif., internetworking products maker said.

SHORT TAKES **MasPar Computer Corp.**, a massively parallel systems maker in Sunnyvale, Calif., is cutting its work force by 25%, or 38 employees. . . . **Kendall Square Research Corp.**, which recently said third-quarter revenue would be well below expectations, causing a loss, has postponed revealing its quarterly financial results until month's end. The Securities and Exchange Commission, meanwhile, is reportedly probing whether the company prematurely books its revenue.

Geoworks ties comeback to PDA

By James Daly
BERKELEY, CALIF.

Outside of Richard Nixon and Ebenezer Scrooge, few people are given a second chance to redeem themselves. Except perhaps Brian Dougherty, chief executive officer at Geoworks, Inc.

Three years ago, Dougherty and a team of stellar engineers dazzled analysts with the Geos user interface, a zippy alternative to Windows. Geos could run on any IBM compatible, from the original IBM PC to the fastest Intel Corp. 1486-based machine — eating up only 512K bytes of RAM.

Analysts raved, predicting corporate buyers would soon realize that Windows gobbled memory, required the fastest processors and would not run on the installed base of PCs. At the time, Jeffrey Tarter, editor of the industry newsletter "Softletter," noted, "If I were Bill Gates, this is the one product that would cause me to lose sleep."

Tarter proved to be a poor judge of Gates' sleeping habits. True, Gates salivated over the technology and even met with Dougherty to try to bang out a price for Geos.

But Dougherty nixed any deal and, within a year, Windows had rolled over corporate America as well as Geos, and its accompanying Ensemble application suite was on its way to becoming a winner in the next Computer Bowl. Ensemble eventually sold more than 750,000 copies but failed to win developer support.

"We got run over by Microsoft and all its marketing," Dougherty said. By the fall of 1991, the handwriting was on the wall: Either figure something out or fold the tent.

Then a funny thing happened. Handheld wireless devices straight out of the adventures of Dick Tracy began to emerge. Called personal digital assistants (PDA), these units promised true anytime, anywhere communications, allowing users to link into a variety of services while on the run.



Geoworks' Brian Dougherty: *'Life . . . really takes off at $100'*

More than a million PDAs are expected to be in the hands of corporate gypsies by 1996, with more than 4 million in use by the end of the decade, said researchers at BIS Strategic Decisions in Norwell, Mass.

Seeking to snatch victory out of the jaws of defeat, Dougherty pitched Geos to PDA makers. "We never lost our faith in small, tight software," he said.

Analysts said they like the changes at Geoworks. "They are masters of writing small, tight code," said Tim Bajarin, president of Creative Strategies Research International, Inc. in Santa Clara, Calif. "They can get more mileage out of an 8086- and 8088-based device than anyone."

Earlier this year, both Casio, Inc. and Tandy Corp. said they would standardize their Zoomer PDA on the updated Geos 2.0. Sharp Electronics Corp., AST Research, Inc. and Canon, Inc. will also use Geos.

With a second chance in the air, Dougherty said he is not going to make the same mistakes twice. That means software support, so he spent a chunk of the company's recent developer's conference evangelizing.

Center of attention

Analysts say grabbing and holding developer interest is critical. "You won't see old versions of new software but entirely new types of applications . . . customized to share information with others," predicted Jeffrey Henning, a senior analyst at BIS.

Still, the PDA market is anything but a certainty. The Zoomer, for instance, has a $700 street price, but that is expected to fall in the next 12 months. "For us, life begins at $500, gets interesting at $300 and really takes off at $100," said Geoworks President Gordon Mayer.

Meanwhile, Dougherty's old nemesis, Microsoft, is lurking nearby. Early next year, Microsoft is expected to introduce Microsoft At Work, a Windows-compatible operating environment that will appear on handheld devices from Compaq Computer Corp., Motorola, Inc. and others.

It is questionable whether Geoworks can rise Phoenix-like from the ashes, but Geoworks officials know the stakes. "If [PDAs] don't exist, we don't exist," Mayer said.



Making connections

Geoworks is targeting smaller developers who feel shut out of the mature mainstream software market, "where distribution and marketing outweigh technology," said President Gordon Mayer. It is also furiously inking networking deals.

Novell, Inc. recently agreed to license Geoworks to distribute Novell's NetWare Client with the Geos operating system. This lets Geos-based systems connect directly to the server and all network services.

Geoworks also recently added **CompuServe** support. **America On-Line** and **Motorola's Embarc** wireless electronic-mail network have also signed on.

Powersoft to buy Watcom

By Melinda-Carol Ballou

■ **Powersoft Corp. last week said it will acquire Watcom Corp. in Waterloo, Ontario, a purveyor of high-end databases and C/C++ tools and compiler products.**

Powersoft, like other players in the client/server tools market, has attempted to fill in gaps and strengthen its product capabilities by providing bridges to other vendors' offerings, such as Intersolv, Inc.'s version control software. With this purchase, Powersoft hopes to beef up its products by integrating them with Watcom's higher-end, comprehensive offerings.

For approximately 1.4 million shares of Powersoft common stock, Powersoft will acquire Watcom's outstanding stock when the deal is finalized early next year. This is the equivalent of $40 million to $44 million, or 11% of the combined shares of the new company, according to Mitchell Kertzman, chairman and chief executive officer of Powersoft.

While some Powersoft users have looked to other vendors for complex, transaction-intensive application development, Powersoft officials said they hope the Watcom acquisition will stem defections in that end of the market.

Some users spoke favorably of the high-end capabilities of Watcom's C++ environment.

Crowd pleaser

"Watcom targets true developers, not just people who are hacking around," said Don MacDonald, information systems officer at Chemical Banking Corp. in New York. "If you're writing some convoluted [Dynamic Link Libraries] with a million transactions going all over the place, and it has to be 100% guaranteed to always be fast, I'd pick Watcom."

Industry analysts said Powersoft is paying a lot for Watcom, but the high price tag may ultimately be worth it.

"This gives them the ability to do both the client and server portions of the applications — it's like having a car with four wheels instead of two," said Tony Picardi, an analyst at International Data Corp., a Framingham, Mass., consultancy.

However, other analysts said the move is a defensive one. For example, Competitor Gupta Corp. offers a database along with its development tools.

Powersoft began shipping PowerBuilder with the Watcom database this fall and needed to retain control of the product, said Tim Harmon, analyst at Meta Group, Inc., a Stamford, Conn.-based consulting firm.



FROM OUR READER FILES

"One of our users was having computer trouble, so we asked her if her cable had fallen out or become unplugged. But the user insisted there were no cables attached to her computer at all. One of our secretaries put a name to this kind of setup – Immaculate connection."

Steve Wheeler
Information systems specialist, Union National Bank, Wichita, Kan.

illustration by Mark Marshall

Looks like Unix, Microsoft's mysterious Chicago and the server version of Windows NT are the operating systems of the future, at least according to a five-vendor panel at a Technalogic Partners conference in San Francisco. The vendors — Clarify, D&B Software, Gupta, IMRS and PeopleSoft – gave Unix and Chicago a perfect five. OS/2 got 2.5 votes.

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The 5th Wave *by* Rich Tennant



Inside Lines

Wagers, please

Jim Cannavino's promotion to the inner sanctum at IBM caught him by surprise, according to sources, who say the company will probably soon choose a successor from inside. Speculation has focused on Bill Filips as the leading candidate, with Bob Corrigan and Lee Reiswig getting mentions.

Talk about reading over your shoulder

Microsoft is preparing to add a nifty little feature to Word 6 for the Macintosh, due early next year. It's called IntelliSense and corrects misspellings and grammar goofs while you type. A Windows version will also be available. Microsoft will also make a run at the Macintosh database market in January when it introduces the $500 Foxbase for the Macintosh.

Newton stumbles Down Under

Austel, the Australian telephone company, may seek prosecution of Apple because it released the Newton without getting the proper permit for its telephone dialing function. According to Jim Holm, Austel's inspectorate manager, the Newton tone dialing function does not conform to Australian exchange standards and is likely to dial incorrect numbers. Apple has sold an estimated 300 Newtons in Australia so far. Amstrand, which has released a similar personal digital assistant in Australia, also faces the problems.

In their backyard

Geographic proximity is no guarantee that an outsourcing vendor will win a deal. Texas Utilities Co., the $4.9 billion Dallas-based utility, confirmed it has selected IBM's ISSC subsidiary for a PC and LAN management and acquisition project. ISSC is believed to have bested EDS from nearby Plano. Chrysler Systems, Inc. also bid on the deal.

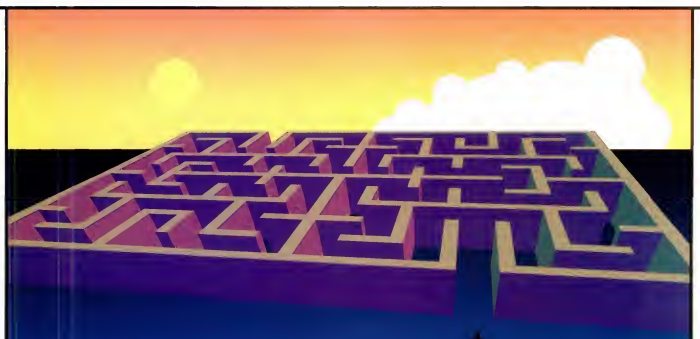
Even the midrange goes multimedia

IBM plans during 1994 to combine the three multimedia software packages it sells for the AS/400 into a single integrated product and said it will add tools that will start enabling the midrange system for multimedia development. Currently, AS/400 multimedia applications have to be developed in dumb-terminal mode and then moved to a PS/2 front end. Tools due out next year are supposed to let programs be developed for the PS/2 "to some extent," with more complete capabilities to follow, the company said.

Don't worry, be happy

Microsoft is still taking a "what, me worry?" stance on the COSE alliance of Unix vendors. At a customer briefing that the press joined via videoconfer, Microsoft vice president Jim Allchin said exactly the opposite, descendingly. "We're not sure what the COSE group is up to. They keep changing their goals." Asked if Microsoft would support a unified Unix API from COSE, Allchin humorously replied: "That's like asking if you believe in the Easter bunny."

If you find yourself at Comdex/Fall '93 unable to look at another demo or in the mood for something a little less logical, you might want to hobble over to ATS ComputerCentre Pte Ltd. (#S637). It has a virtual reality demo that invites attendees to "enter" a PC-generated virtual world that includes an interactive walk through the world's tallest building. Or, you can stop by Software Sorcery's booth (#A1729) and check out the missiles, medieval knights and a space junkyard. If you need a tennis fix, check out Corel's Comdex Tennis event on Tuesday at Caesar's Palace. You'll find Rod Laver, Johan Kriek, John Lloyd and Pat Dupres on the courts. Or if you like your drama live, visit the North Las Vegas Air Terminal, where close to 50 software execs will engage in simulated laser dogfights while flying real Morchetti SF 260 aircraft (#A1729). If you've stumbled across any battle plans, phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's *24-hour voice-mail tip line at (508) 820-8555.*



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If you would like to receive a free video showing how we've helped a number of businesses work more profitably, give us a call at **1-800-ROLM-123.**

And you can leave all those drastic, cost-cutting morale-squashing measure to someone else. Your competitors, for instance.

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